ARMOR

CARDED

TANK CREW PROFICIENCY
(See page 34)

JANUARY-FEBRUARY, 1956 • 85 CENTS

ARMOR ASSOCIATION NOTES

At a recent meeting of the United States Armor Association's Executive Council, plans for the 67th Annual Meeting were approved. Throughout the past year it was felt that we would be able to accept the invitation of Fort Hood to hold our meeting at that post. By visiting Fort Hood the Association would have been broadening its base. However, due to major changes at that post it is not feasible to meet there as originally planned. Instead it was decided that:

The 67th Annual Meeting be held at Fort Knox, Kentucky.

The dates are Thursday and Friday the 26th and 27th of April 1956.

Notices with detailed information will be sent to all members in February.

Membership cards will be included with the meeting notices.

Included in the notice will be a reply card so that you can state your intentions as to whether you will or will not attend the 67th Annual Meeting. We ask that you return this notice promptly, even if you cannot be present, so that we can inform our hosts as to the exact number of off-post members expected to be present.

Each year the planning committee at Fort Knox has "outdone" itself on the previous year. Those of you fortunate to be present at previous meetings can appreciate the tremendous efforts expended by Knox in making us welcome. These meetings have accomplished a great deal in cementing the relationship of our members. They have also gone a long way to promote the professional improvement of the membership. They also serve well as the common meeting place for those interested in the art of mobile warfare.

Nominating and auditing committees were appointed and they are busy preparing their reports. A building committee was also appointed to consider the purchase of a permanent "Home" for the Association's headquarters and editorial office.

To make the 67th Meeting representative of all Armored officers, now is the time to check your status! Have you renewed your membership? Are you receiving the magazine? If you are in good standing, ask your fellow officers if they are members. Encourage new members. Let's make the 67th Meeting the biggest and best in the Association's history.

See you at Fort Knox in April.

The Secretary

The United States Armor Association

Continuation of
The United States
Cavalry Association
(Established 1885)

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ARMOR

The Magazine of Mobile Warfare

Continuation of THE CAVALRY JOURNAL

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LETTERS TO THE EDITOR

On 3-D Warfare

Dear Sir:

I wish to thank you and Colonel Rigg for your very interesting November-December *ARMOR* article, "3-Dimensional Warfare." I read the reviews in the *New York Times,* the *Boston Herald,* and *The Army Times* before I read the original article today. Its appearance is a very much appreciated vindication of the arguments I have been having since I read General Gavin's "Airborne Warfare," and saw in *Popular Mechanics,* the Hiller platform. It seemed to me to be the ideal way to bring about "vertical envelopment."

While at The Armored School, I was surprised by the Armored Division's logistic limitations. As Liddell Hart stressed, the 240 mile "tail" of the division, supported by wheeled vehicles, makes the division both road bound and unwieldy. Logistics so delivered never let the tanks and armored infantry fully develop their capabilities.

The principle of the Hiller Platform changes all this.

Even in its basic unproved form, which is all I have seen in the well publicized Navy photograph, it is a most revolutionary aerial transportation device. Some of the possibilities I have considered that might be used to amplify your article are:

1. Reconnaissance and raids on supply dumps, command posts, rail lines and road marches could be fantastically successful. Platforms equipped with quad 50s, flanked by others mounting recoilless rifles, could wreak havoc wherever the enemy massed his forces.
2. Mobile defense could be genuinely mobile, cut free from supply lines to the rear, and provided with substantial elements of its own short range tactical air support.
3. The need for complete air cover, impossible considering the strength of our most likely adversary, would be lessened. There need be few tactical targets—no congested roadways, no great concentrations of matériel near the battle position, no masses of troops in assembly areas. With few tactical air targets offered by our mobile army, our own tactical air force would be greatly freed of its largely defensive role, and could then be sent out on more offensive operations.
4. Your idea of a bazooka-helicopter combination is marvelous. While at Fort Knox, I requested the use of a helicopter and bazooka to prove how easily a point target could be destroyed from a stable aerial firing position. Unfortunately, I didn't have the chance to try the experiment, but the idea still seems very practical. It should have particular merit as part of the infantry anti-armor base.
5. Leaping personnel carriers could press forward an attack after initial forces were forced to stop to resupply and rest. There would be no problem of passing through the lines, or tiring moves from assembly positions to the front lines, as the reinforcements would leap over exhausted comrades below. These same carriers could seize important terrain, forcing on the enemy costly delays and inopportune changes in maneuver.

It is taken for granted that what we can do against any enemy who is unprepared for this form of attack, he can do to us, if we are unprepared.

I know from the reaction at even my low level, the actual development and application of these ideas will involve many uphill fights. For what it is worth, I send you this notation of my conviction that the revolution you are suggesting is the right one.

I hope I will someday have the opportunity of participating in its development.

2D LT. CHARLES W. ERVIN

Co. A, 1st Student Battalion
ASA
Fort Devens, Mass.

More on 3-D Warfare

Dear Sir:

My congratulations to Lieutenant Colonel Rigg on an exciting concept beautifully presented.

ELLIOTT A. CAPP

Graphic Information Service, Inc.
17 East 45th St., N. Y. 17, N. Y.

• *In addition to the two letters above two inventors have written, stating that they possess the means to make the tanks airborne. These letters have been placed in the proper channels. Maybe this concept isn't so far away after all.* —ED.

3-D War—A Rebuttal

Dear Sir:

In his imaginative article "3-Dimensional Warfare," Lieutenant Colonel Rigg offered some most interesting and thought-provoking ideas. His concept of flying tanks and personnel carriers is no less plausible today than atomic weapons were 20 years ago. But his high flying concepts went into a tailspin when he concluded that his unique machines could eliminate the need for roads, bridges and engineers, or that his flying logistical carriers could even begin to deliver the tremendous quantities of men, materials, equipment, ammunition, POL and other supplies required to be moved from rear to fighting front.

Let us question whether these proposed weapons would achieve the revolution in warfare as claimed. Colonel Rigg offers six elements in his revolution which we will examine individually.

Will this proposal eliminate the military use of roads? Only to the extent that roads are used in the immediate fire fight. But we do not fight on roads. We move on them until the enemy is engaged, and then deploy and fight over the surrounding terrain. The major military use of roads is for the logistical support of troops engaged in combat. With well over 500 tons of supplies required each day for a single division, roads and railroads are the lifeline of the combat forces. Nothing in the proposed revolutionary war would decrease these requirements, and it is not unreasonable to assume that flying tanks would at least double the already fantastically large POL requirements of an

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Rates: See bottom of contents page.

armored division. Armor officers should not forget the fall of 1944 when the opportunity for a decisive victory at Metz was lost because the logistical support had been outdistanced.

The solutions offered to the logistical problem are prepackaged flying pallets of supplies and flying logistical carriers. With this bold stroke we abolish the chain of depots. Our bounding Beehives of supplies merely squat on a handy piece of flat terrain waiting to be called on to bounce to the required point of consumption. Dispersed over the countryside and capable of self-delivery, our new supply system has certainly eliminated the requirement for a main supply route. Unfortunately, a few issues and obstacles are raised. First, this dispersion; how great an area will be required to disperse the normal three days of supply for a division! The division supply point would cover at least five acres and would require 200 men to serve as pilots even if the logistical carriers were used all the way to the front. If the flying pallets are used for local distribution, the area and manpower requirements are even greater. The problem of control of these individual loads of supplies to insure delivery of proper supplies to the appropriate user would be fantastic. And prepackaging supplies in fixed ratios of Class I to III to V invites waste. A unit commander would have to receive and take care of the entire package even though he needed only a few items from it. To get a ton of food, he would have to accept a ton or more of gasoline, even though all his tanks were full. A flying pallet is an expensive way to deliver a radio tube! And loss of local air superiority for even a brief period could starve a division out of existence.

But what of this tremendous advantage of the third dimension which renders obsolete the traditional natural barriers as well as man-made ones? Won't we at least achieve a revolution there? Not unless our enemy ceases to cover his obstacles with fire. A slow flying armored vehicle would be an exceptionally vulnerable target to those anti-aircraft weapons which have already proven themselves as ground anti-tank weapons. Just as obstacles are now used to direct an enemy force into a desired direction, so could they be used to force these new vehicles into the air to be shot down like a covey of quail.

Although the helicopter, assault aircraft and vertical take-off aircraft all tend to reduce requirements for long airstrips in the combat zone, the increasing heavy loads being air transported indicate a continuing requirement for hardstandings of some sort to support these machines wherever they come to rest. The flying logistical carriers would add to this problem if the supplies are not to drop out of sight in the mud.

It follows, therefore, that roads, bridges and the reduction of obstacles as well as the construction of airfields remain as essential as heretofore. Increased technology in war has continually required greater rather than smaller numbers of engineers. New weapons may require new types of barriers, but you may be certain that engineers will be required to build them and to breach those of the enemy.

The probability of shortened conflicts is questionable. The hit and run tactics recommended presume that the enemy will remain in place until we eventually destroy his will to resist. History has indicated that victory is won by defeat of the enemy and occupation of the ground. Raids and bombardment, no matter how devastating, cannot defeat a determined defender who can use mobility to avoid the raid or shelter to withstand it. The decisive victory will depend on the utilization of all available weapons—a combined infantry-armor-artillery-engineer team with air support. No miracle weapon can substitute for all. The tanks will still need infantry, and the infantry will still have to leave their shelter to attack. Until the portable foxhole becomes a reality, the soldier in combat will find his best shield to be the rugged terrain.

As to three-dimensional warfare, any soldier who has ever attacked uphill knows that warfare is already three-dimensional. High ground which affords superior observation and fields of fire continues to dominate the lower ground whether used for ground attack or for launching an attack through the air. "Take the high ground" will remain the byword of the tactician, and the soldier who fails to use the terrain to his best advantage is doomed to failure.

One last consideration is the relative cost to the nation. Economy of force in its broadest sense dictates that the nation's resources be applied in the most effective manner to achieve the national objective. The providing of individual soldiers with fuel-consuming flying platforms or helicopters to avoid the breaching of minefields or the construction of bridges is an uneconomical frittering-away of the country's resources and manufacturing power while increasing the manpower requirements for maintenance and supply. Any reduction in combat engineer requirements would be made only at tremendous expense in men and matériel.

With each new development we are told that warfare will be revolutionized. Neither Hannibal's elephants nor gunpowder nor yet the atomic bomb has brought on this revolution. In 1970, just as in the past, the 3-D's of war will be Doughboys, Dirt and Determination!

Major George B. Richards

6812 25th Street, North
Arlington, Virginia

His Efforts are Rewarded

Dear Sir:

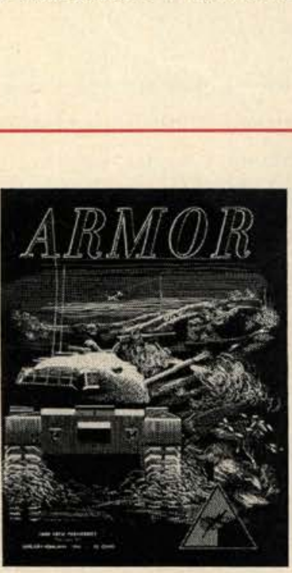
Enclosed is $4.75 for a year's associate membership. This membership will be awarded to Master Sergeant John J. Meyer who is a member of Company C, 250th Tank Battalion, New Jersey National Guard. This award is for Sergeant Meyer's outstanding leadership and his untiring efforts to improve the training of his organization. His ingenuity and ability as an instructor did much to achieve a high percentage of weapons firing qualifications within his unit.

Sergeant Meyer also achieved the highest score in the machine gun qualification course in his battalion.

Major Rudolf W. Kogan

Office of the Army Advisor
250th Tank Battalion, NJNG
Phillipsburg, New Jersey

● *May we also add our congratulations to the Sergeant for a job well done.*—Ed.



THE COVER

Mr. Jack H. Bain, a civilian illustrator, presently employed by the Training Literature and Reproduction Department of The Armored School, is the artist to whom we are indebted for this month's excellent cover and also for the fine drawings that accompany the article "The Classroom in the Field." Mr. Bain was formerly assigned to the TL&R Department at Knox as an enlisted man.

ARMOR, 1955

"I am confident that you will contribute to the Army's role in deterring or winning war." Thus end the greetings from the Chief of Staff, General Maxwell D. Taylor, on the occasion of Armor's 179th Anniversary. The letter from the Chief of Staff appears in full on the opposite page. It should serve as an added impetus to all our actions for the coming year. For the past three years it has been our custom to review the progress Armor has made during the past twelve months and acknowledge the greetings of the Chief of Staff.

The 66th Annual Meeting of the Association was held at Fort Knox on the 28th and 29th of January. The meeting drew the largest number of officers interested in mobile warfare to date. It is noteworthy that four of the six Army commanders attended. Also the Commanding General of CONARC, the Deputy Chief of Staff for Logistics and many others. The Association was fortunate in having such an outstanding officer as General Williston B. Palmer, the present Vice-Chief of Staff, elected to the Association's Presidency. It was he who delivered Mr. Milton's address when at the last minute the Assistant Secretary of the Army for Manpower was unable to attend.

In March the 3d Armored Division was reorganized as a tactical division. Concurrently the Armored Replacement Training Center was organized at Fort Knox with the mission of conducting advanced individual training and Armored specialist training.

During the months of April and early May all eyes were on Desert Rock where, for the first time, fully manned tanks and armored personnel carriers were exposed to an open atomic shot. It was also the first time that troops had to depend on their combat vehicles for protection from an atomic blast. They not only proved their invincibility against the blast but they were able to exploit the blast and immediately make a breakthrough to their objective. This story was covered in the May-June issue of *ARMOR*. This significant event was likewise well publicized by the press throughout the country.

D/A announced that the 3d Armored Division would "Gyroscope" to Europe in the Spring of 1956. This will give the Seventh Army two Armored Divisions.

On the first of July the new NCO-Specialist program went into effect which added considerable prestige to our noncommissioned officer corps.

During the Summer the 2d Armored Cavalry Regiment, stationed in Germany, gyroscoped with the 3d Armored Cavalry Regiment stationed at Fort Meade, Maryland. The lessons learned in this move were reported in the November-December issue in the hope that it would assist the 3d Armored Division when they move this coming Spring.

In October a plaque commemorating the establishment of the first home of the mobile arm was unveiled at Carlisle Barracks, Pennsylvania. This project was sponsored by the Association and the heir-units which contributed funds for the erection of this fitting memorial.

The 48th Infantry Division (Georgia-Florida National Guard) was converted to the 48th Armored Division in November.

The year ended with four Regular Army tactical armored divisions, an Armored Replacement Training Center, and six National Guard armored divisions. In addition, with the formation of new armored groups and tank battalions, there was armored strength added within the National Guard.

The biggest maneuver since the War—SAGEBRUSH—was completed in December. Two armored divisions participated and the 1st Armored Division is now stationed at Fort Polk, Louisiana.

Many units around the world took note of this auspicious occasion by celebrating our 179th Anniversary. The local Washington, D. C. Armor Chapter staged a party with more than 200 members in attendance. The Armor Section at the Infantry School held a get-together for Armored personnel and friends. (It would be interesting to know what other units did to honor this anniversary and we welcome any reports.)

What about the coming year? Only the Power above knows what will happen, but we can assure the Army's eminent Chief of Staff that he has our whole-hearted support in the carrying out of his program of continuous progress within the Army.

UNITED STATES ARMY
THE CHIEF OF STAFF

TO THE ARMOR OFFICERS AND MEN
OF THE UNITED STATES ARMY

Armor has reached the occasion of its 179th anniversary, and I join with other soldiers of the United States Army in extending congratulations and best wishes to all members of this powerful, mobile arm.

Armor's anniversary is a reminder of the historic achievements of your branch which has consistently met the challenges of war and peace with vigorous and effective response. The officers and men of Armor have always possessed an aggressive spirit that has rapidly projected their military means and machines toward success in mission. You may take pride in your role and performance of duties today, because you are contributing significantly to the preparedness so essential to our national security.

As the Army progresses toward increased mobility and striking power, I am confident that you will contribute to the Army's role in deterring or winning war.

Maxwell D. Taylor

MAXWELL D. TAYLOR
General, United States Army
Chief of Staff

LEADERSHIP, 1956

By GENERAL JOHN E. DAHLQUIST

Commanding General Continental Army Command

MUCH is being made today of the greatly increased number of skills that our soldiers must learn. The need for radio and radar specialists, fire computers and forward observers, master mechanics and missile maintenance men has made today's Army a far cry from the one I joined in 1917.

But while we talk of these mechanical skills, we tend to forget that our technicians and specialists of whatever rank in future combat will need a quality demanded of all officers, expected of all noncommissioned officers and sometimes found at the time of greatest need in the private soldier.

The quality is leadership, and with every advancement in modern arms the need for leadership increases. Our top leaders must bear terrible responsibility, far greater in degree than that borne by past commanders. Today the need for leadership extends also to lower levels more than it ever did before, maybe to the one man in a key area who survives an atomic weapon.

Atomic warfare has increased the leadership burden. From the commander who decides the when and where of an atomic weapon to the man on the atom-blasted ground, the problems and pitfalls of modern war demand leadership of the highest order.

A year ago I read an article in the *Army Combat Forces Journal* entitled "The Survivor." How to get this survivor back into action as part of an effective force was the problem posed by the author. In principle the answer is simple. The man will fight under the guidance of leadership, whether he supplies it from the wellsprings of past training or whether it comes from another survivor.

For some time now we have been studying ground fighting under atomic conditions. We have learned many things, but probably the most widely applicable lesson is the need for dispersion and the resulting need for leadership. Dispersion creates more smaller units. Each must have a leader and his chain of subordinate leaders. And any of these subordinate leaders, in view of the sudden mass destruction potential of the atomic weapon, may be faced with the task of reorganizing and commanding a unit several rungs up the command ladder from his normal assignment. Only a real leader can face that challenge and be successful.

What can we do to ensure that our leaders, whether they command a tank or a division, will react promptly and properly when subject to the rigors of atomic war? The answer, of course, lies in a soldier's training. In our military concepts, a soldier is trained not only to be led, but also to lead. When you train a tanker as a driver, part of his lesson is that he must be prepared, along with each other crew member, to take over command in an emergency. He is trained to follow and he is trained to lead.

The Army never can have too many leaders among its ranks. During mobilization, the men in uniform at the beginning can expect soon to be functioning two levels higher than their peacetime assignments. The quality of our wartime leadership, then, depends to a very great degree upon the leadership training we give our officers and men in peacetime.

Because leadership is the result of a sum of mental and moral qualities, found in different proportions in different leaders, it defies exact definition. Lacking definition and analysis, it resists the "lesson plan" treatment in training. What will induce one man to acquire the traits of leadership will have no effect on another. The possession to a great degree of one trait will make one man a fine leader, but the same trait in another man might leave him far short of our leadership standards. Further, two equally successful leaders may have applied entirely different parts of themselves in achieving their success. One depends on colorful, personal leadership; another's quiet competence attains the same goal.

For generations the Army has been developing leaders despite the inherent difficulties of formal courses in leadership. To improve its teaching and to increase its number of leaders, the Army has devoted considerable effort to isolating and instructing leadership principles.

General John E. Dahlquist holds a Master's degree from University of Minnesota. He attended the First Officcers Training Camp, Fort Snelling, and was commissioned in Infantry in 1917. He entered the Regular Army that same year. He served in Europe in the Army of Occupation until 1922. From 1923 to 1929 he was a student and instructor at The Infantry School. Graduating from C&GS in 1931, he served in the Philippines to 1934. He next attended the Army War College and the Air Corps Tactical School. He served in the War Department from 1937 to 1941. He served in England as Deputy Chief of Staff, ETO. He returned to the States in November 1942 as Assistant Division Commander, 76th Division. In 1943 he organized the 70th Division. He assumed command of the 36th Division in Italy in July 1944 and held that capacity throughout the War. After the War he held stateside assignments and returned to Europe in 1949 commanding the 1st Infantry Division and later V Corps. He returned to the States in 1953 as CG, Fourth Army. In the Summer of 1953 he was appointed CG of AFF and is the first Commanding General of the newly formed Continental Army Command.

U. S. Army

The traits of leadership are knowledge; physical and moral courage; initiative; decisiveness; tact; justice; dependability; bearing; physical and mental endurance; enthusiasm; unselfishness and integrity. The man who possesses and has developed these traits is ready to apply the leadership principles to his command. These principles are:

1. Be technically and tactically proficient.
2. Know yourself and seek self improvement.
3. Know your men and look out for their welfare.
4. Keep your men informed.
5. Set the example.
6. Be sure that the task is understood, supervised and accomplished.
7. Train your men as a team.
8. Make sound and timely decisions.
9. Develop a sense of responsibility among subordinates.
10. Employ your command in accordance with its capabilities.
11. Seek responsibility and take responsibility for your actions.

Guided by these principles, and possessed of the leadership traits, the leader exercises command. He inspires proficiency, discipline, morale and *esprit de corps* within his unit and the result is the goal of all units, combat effectiveness.

Although the form of leadership differs in many respects at the various levels of command, the leader, whatever his rank, utilizes the same traits and applies the same principles. The leadership displayed by a tank platoon leader during a counterattack and that exercised by his division commander are quite similar. The physical courage demanded of the platoon leader is balanced by the moral courage the two-star general demonstrates in his decisions. The platoon leader's problems are eased by the fact that his tank commanders can see him and follow him. It is a personal thing and serves to reduce the distractions of enemy fire. The division commander, probably not under direct fire and its distractions, gains composure but is offered fewer opportunities to exert personal leadership on the field of battle. Ordinarily he must lead through confidence previously established, through the exhibition of professional proficiency and through the force and fairness of his orders.

At all echelons of command there is one facet of leadership which cannot be overlooked—the duty to provide alternate competent leadership. The tank commander must insure that his assistant is ready and able to take command. The division commander must keep his assistant division commander fully informed. It is here that we get back to our survivor of an atomic weapon.

Will he stagger to his feet, thanking the Lord that he is alive, and remove himself from the war? Or will he praise God that he has been spared to fight again and begin doing it? Will his soldier's instinct tell him that the enemy's weapon indicates a critical area, a probable attack target? Or will he panic and cower in any remaining cover?

The answer to these questions lies in leadership. If our man recovers and once again becomes an effective soldier, it is due only to well applied leadership. The leaders who gave him his basic training imbued in him a will to fight and the skill with which to do it. His unit commander made him understand why he was fighting and the tactical situation under which the unit was operating. His tank commander or infantry squad leader gave him the personal confidence he needs to make his own sound decisions. His entire Army training prepared him for this moment when he must become his own leader.

Visualize an atom-blasted wasteland and one solitary soldier deciding how best to stop a powerful, determined enemy attack. What use is leadership against such odds? The answer is that leadership, and only leadership, can be applied to reduce the odds, possibly to an acceptable ratio.

Our solitary soldier finds arms on this apparent wasteland, he finds other soldiers, each of whom thought he was "solitary." The soldiers pool their skills, become a unit and assess their strength and capabilities. Elsewhere in the wasteland, other soldiers band together to form additional units through the same type of leadership. The enemy, expecting no resistance after the awesome blast, finds instead a resisting force, case-hardened and bent on revenge. The odds have been shortened and the attack blunted.

Will leadership stand that test? Was the commander prepared to act even before his communications were re-established? Could his battalion or company or platoon recover in time to predict the time and place of the assault and move to stop it? Did his men have the necessary confidence in his leadership to carry out his orders even after the soul-shaking shock of an atomic blast? Leadership, in training and in combat is the answer, as it has been in years past.

The fine traditions of the American fighting man are known to all of us. We honor the men of Lexington and Valley Forge, of Lake Erie and New Orleans, of the Alamo and Chapultepec, of Vicksburg and Gettysburg, of Manila Bay and San Juan Hill, of St. Mihiel and the Argonne, of Bataan and Bastogne, of the Naktong and the Chosen Reservoir. They were fighters and they had leaders.

Whether any future war will be as short as today's experts predict is something still to be decided. (Most past wars were many bloody years longer than calculated at their beginning.) But if the war be short, it will be so only because the eventual winner overwhelmed the loser in the first onslaught. Leadership will be paramount and the lack of it will be fatal, not only to the leader and his command, but to the nation. Only existing leadership can count in a short war, for no time will be allowed to develop new leaders.

If on the other hand, future war is prolonged, it will be because the defending nations rise, under leadership, to a fighting pitch unforeseen by the aggressor. Behind this unexpected military shield, armed strength and the leaders to wield it must be made ready to assume the initiative and overthrow the aggressor. The degree of existing leadership will be a major factor in determining the time elapsing between the first attack and the final victory.

The problems of the military leader today are many and varied. Past military leaders have been in the same situations, but the combination of atom, economy and the cold war give us variations. We cannot turn entirely to history for our answers.

The cold war demands of us military strength and economic stamina. The combination which we have chosen calls for moderate forces in being and a strong reserve ready to use as needed. When tactical atomic weapons were added to the world's arsenals, the Army had to study their probable effects on organization and tactics. And the budget pinch put us in the position of spending as little as possible to achieve the state of readiness demanded by the presence of the cold war and the atom.

At the unit level, all three of the circumstances are felt and all three create problems. Budget considerations affect troop billets, schooling, personnel spaces. The cold war demands a state of instant readiness, a condition which only the best-led units can maintain over a period of years. And the atomic weapons force experimentation in tactics and organization.

Leadership must compensate for budgetary restrictions on construction and equipment. Leadership must accept and solve the cold war problem of the short term draftee and his unknowing resentments, and leadership must master the techniques of warfare in an atomic age.

As a unit leader, you must constantly consider the three units which are yours. If you command a company you have three companies, the one presently occupying your barracks, the company which you lost in the past year as its men completed their training and reverted to the reserve, and the third company, the one you will get next year.

Your leadership is felt through your present company as part of the nation's in-being strength. Are your men acquiring the skills and duties and ideologies of a soldier? Are they ready today for whatever the nation might ask? Do they know why it might be asked? Or are they merely counting the days until they return to civilian life?

What about the company which just left? Was your leadership of such caliber that the lessons you taught are enduring? Will your men be enthusiastic, qualified reservists? Will you, as well as they, be happy to be serving together should they be recalled? Are you glad to be rid of them, or are you proud to be sending well-trained men to a reserve unit?

And what of your third company, the one which will be arriving? Are you prepared to use every moment of its time with you? Will you produce for the Army more leaders from this new company? Will your training reflect the newest techniques in tactics and weapons? Under your leadership can one of these still unseen men become the battlefield survivor with the desire to rally and fight, and the ability to snatch victory for his country on tomorrow's battlefield?

You will note that thus far I have said little about rank in this discussion of leadership. It is true that you can expect to find a higher degree of leadership as rank increases. But it is not true that rank makes a leader. Rather, rank is likely to be awarded to the man who shows himself to be a leader. The point is elementary, but I make it here to emphasize that rank can be awarded relatively easily, but that obtaining true leadership is a slower process. In order to be ready, our Army must have a reservoir of leaders, ready to don the mantle of rank and exercise leadership demanded by the job.

You who are leaders must see that each of your subordinates is developed to the highest degree of his leadership potential. The building of new leaders is one of the major responsibilities of every officer in the Army.

From the standpoint of each of us in the Army, we can divide this business of leadership into three parts. The first, and the easiest, is recognition of leadership in others. The second, considerably more difficult, is the development of our own leadership abilities. And the third, of great importance to the nation's future, is the discovery and training of new leaders. When you are proficient in all three of these you are a true leader, fulfilling your obligations to your superiors, to your subordinates and to your successors.

The Army and Its Mission

When Department of the Army pamphlet No. 355-21 is distributed to all officers, it will behoove each recipient to read, study and discuss its content. If you already have received it, we strongly recommended that you re-read it.

This pamphlet, "The Army in the Atomic Age," spells out the Army's mission. The facts and views stressed are those of the Chief of Staff. General Taylor states in the foreword that *Officers' Call* will, from time to time, serve to give his views on the role of the Army in future war and is "intended to give all officers a common, authoritative basis for approaching their various tasks and to promote constructive discussion of this subject among themselves and with persons outside the Army who are interested in it."

The *mission* of the *Army* is to *defeat* enemy forces in *land combat* and gain *control* of the *land* and its *people.*

With this mission in mind there is a common understanding for projecting the Army's duties for today, tomorrow or the next day. As we progress we must prepare for new techniques which include new weapons, be they in the atomic field or improvements on conventional types that we have employed in the past. To stay abreast from day to day we must incorporate the very best thinking of experts on matters pertaining to personnel, tactics, intelligence and logistics. When summed up this means that our staff sections, as presently constituted, are most important. All portions thereof contribute to success on the battlefield. Our limited manpower must be supplemented with the best weapons, vehicles and equipment in the world. Our intelligence must keep us informed of late developments of any potential enemy. Our organizations and concepts must be constantly scrutinized and kept up to date. And probably our most formidable problem is the logistics "bugaboo." The most modern equipment and latest concepts are useless unless properly supported. This means re-fueling, maintenance, adequate communications, sufficient ammunition support and all the various and sundry complex items needed to keep the combat arms moving on the battlefield of today or tomorrow.

While preparing for the future we must also be prepared for any exigency that might confront us in the defense of our nation today. With all these gigantic problems posed at the Army, at times it seems almost an impossible task. However, instead of being a "boy on a man's errand" our Army is made up of men with the best leadership in the world. The Chief of Staff is the spark at the top. His influence must and does permeate through the ranks to the squad leader. In this way we can face the task ahead with the determination needed to do the job successfully. It is the responsibility of us all to fulfill each day with the task at hand. In this manner we can prepare ourselves for the future.

To discuss these problems with the American public is as essential as any of the Army's other tasks. The price of liberty is not solely a military problem. It is also the responsibility of every American citizen. However, it is the Army's responsibility to present its case to the people in a true light. In this way we will gain added stature among the communities where we dwell. By entering into the activities of the community we show an interest in its affairs and well-being. The community in turn will become interested in the Army story and its problems. It is up to us to present them. What we do—what we say—how we act; on these bases they will form their opinions. This applies equally to all components. Hence, it is everybody's job.

To understand the mission of the Army and bring it to the attention of the American public is a huge and rewarding task. Failure could mean disaster.

CARDED

EXERCISE

By MAJOR ALFRED

The largest Army-Air Force training mission since World W techniques and organization. This story relates the participat conventional, psychological and physiological warfare. The

DURING the Summer and Fall of 1955 the primary training mission of the 1st Armored Division was preparation for Exercise Sagebrush, a joint Army-Air Force maneuver held in Louisiana. Under the command of Major General Robert L. Howze, "Old Ironsides" was designated a member of the Friendly U. S. Forces in the "war games," all phases of which covered the period from 1 November through 15 December.

The purpose of Sagebrush was to increase the capability of Army and Air Force units in performance of combat missions, in both joint and unilateral actions. The maneuver was further designed to provide for certain testings of doctrines, techniques, procedures and weapons. Sagebrush might be termed a controlled free maneuver on the part of both Friendly and Aggressor forces.

U. S. Army

Maj. Gen. Robert L. Howze, CG, 1st AD, observes removal of assault bridge.

The 1st Armored Division was initially assigned as the striking force for III Corps in the exercise. The other Corps units were the 3d Infantry Division stationed at Fort Benning, Georgia; the 12th and 13th Infantry Divisions (Simulated) and normal supporting troops.

Sagebrush's first tactical portion, Phase III, began on 15 November at 0001 hours, and ended at 0600 hours on 22 November. It was preceded by a build-up of intelligence information and a deployment of opposing forces. The U.S. troops encamped to the North and the Aggressor troops to the South of a truce line situated North of DeRidder, La.

On 14 November a U.S. reconnaissance aircraft, escorted by fighters, was intercepted by Aggressor fighters at an altitude of approximately 40,000 feet near Ludington, La. This town is located one-and-a-half miles North of the truce line. A running air battle developed.

This battle culminated in Aggressor launching an attack with numerically superior forces on the evening of 15 November. Aggressor's mission was to destroy the U.S. Forces, seize a majority of communication and supply centers Northeast of the Red River and advance in that direction. Phase III consisted of a withdrawal of U.S. Forces to the North side of the Red River.

The first Friendly units to make contact with Aggressor were the three infantry divisions. With the 3d Infantry Division at the center of the Corps sector, an East flank was formed by the 12th Infantry Division, while the 13th Infantry Division composed the West flank.

As the 1st Armored Division stood in readiness to attack, the 3d Infantry employed a mobile defense. It delayed and defended in zone to the vicinity of Kisatchie and a line running East-West to that point. At this time Aggressor was attacking in three parallel columns on Highways 171, 117 and secondary roads lying between the two.

When the Aggressor East penetration on Highway 117 reached the vicinity of Kisatchie, the Corps striking force was committed. Combat Command B, 1st Armored Division, made a counterattack from West to East, inflicting heavy casualties on Aggressor, and permitted the 3d Infantry Division to control their retrograde action as planned.

The 1st Armored remained on the offensive until the 3d Infantry reached a phase line North of Many,

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MAJOR ALFRED D. WEBSTER, Infantry, served in Eruope during World War II as a rifle platoon leader with the 142d Infantry Regiment, 36th Division. During the Korean conflict, he served with the Prisoner of War Command as Compound Commander and Assistant G3. He is now the Public Information Officer of the 1st Armored Division.

SAGEBRUSH

D. WEBSTER

ar II served to test men and equipment, weapons and tactics,
ion by the 1st Armored Division under conditions of nuclear,
resultant effects could be the bases for our future planning.

La. and passed through the "Old Ironsides" area. At this time the 1st Armored assumed the defensive role in the Corps sector. The Division withdrew on three floating bridges across the Red River. On the other side it phased units to the North, while delaying and defending.

During the final portion of the withdrawal, two infantry battalions were attached to the 1st Armored and assisted in covering the removal or destruction of the bridges. When all tanks, armored personnel carriers and other vehicles had been withdrawn, troops from the 16th Armored Engineer Battalion destroyed or removed the bridges. The remaining infantrymen reached the river's North side by means of footbridges and assault boats.

This segment of the withdrawal took place during the nights of 20 and 21 November. After passing through the 1st Armored area, the 3d Infantry Division established defensive positions on the Red River's North side. The 1st Armored then withdrew through these positions to assembly areas in the Corps sector.

Concurrent with the retrograde action, a task force was organized under the command of Brigadier General Walter B. Yeager, Assistant 1st Armored Division commander. The primary mission of this Task Force "Yoke" was rear area defense against the airborne capabilities of Aggressor, as well as activities of guerrillas and special forces.

Aggressor did attempt to gain control of vital communication centers leading to bridges on the South side of the Red River, by employing drops of parachute troops. The pathfinder team for this major drop was captured by Task Force "Yoke" on the Drop Zone.

U. S. Army

Task Force "Yoke" moves in to capture some 1100 Aggressor parachutists.

As the remainder of the parachutists—approximately 1300 in number—arrived, they were greeted with coordinated tank-infantry action in the Drop Zone. It has been estimated that 1100 of these Aggressor parachutists were killed or wounded.

This estimated casualty figure points up once again the effectiveness of armored units against parachute-delivered troops. On several occasions during World War II, armored strength thwarted airborne operations.

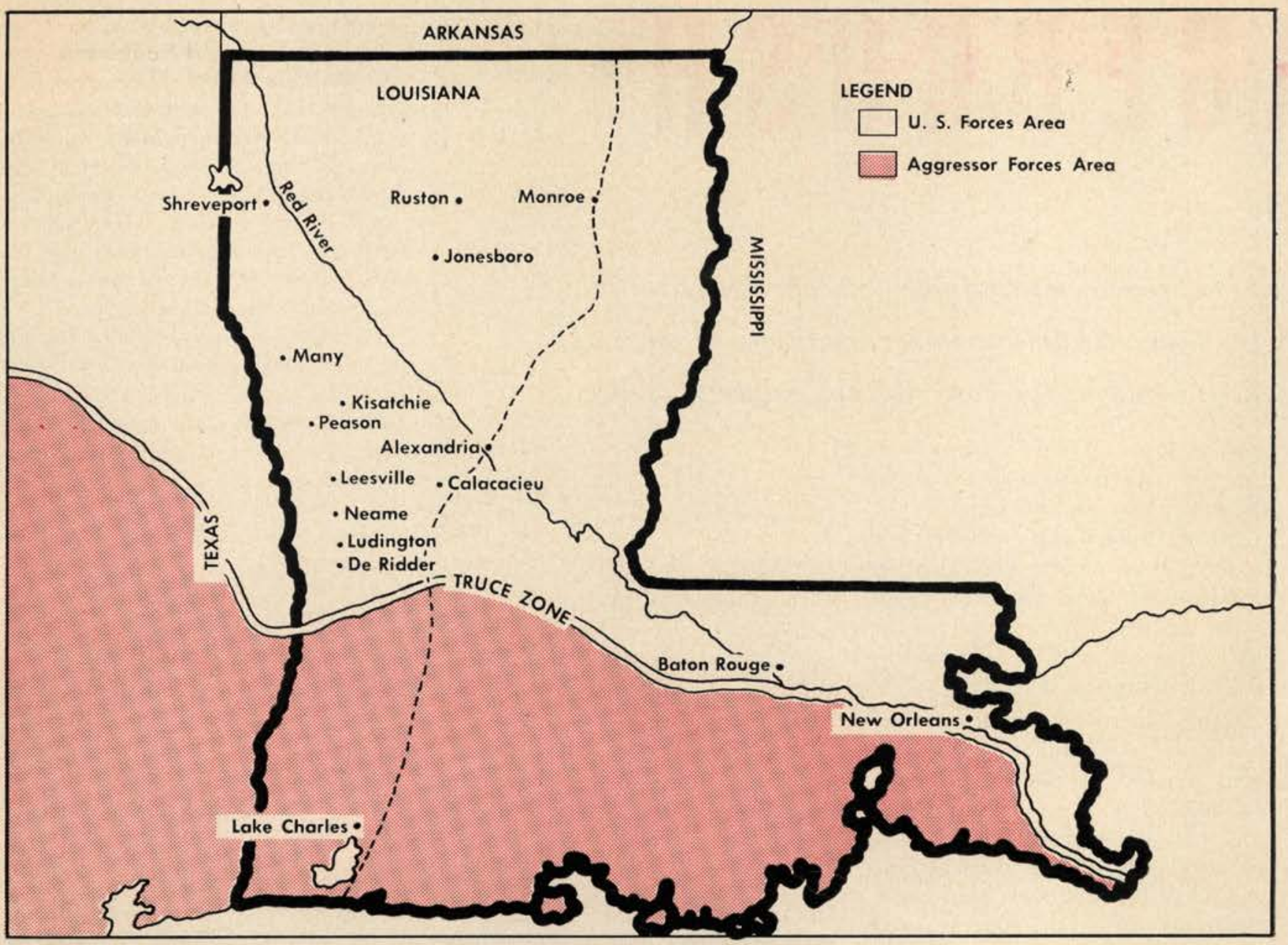
One cannot overemphasize the tactical mobility of armored forces, compared to the relative immobility of parachute-delivered forces once arrived at the Drop Zone. The interception by Task Force "Yoke" provided valuable data for military strategists.

Phase III ended with the Friendly forces in the following positions: the 3d Infantry Division was defending the Red River's North side, with the 12th and 13th Infantry Divisions on either flank. The 1st Armored Division stood by as a Corps reserve.

As planning was completed for the second tactical portion, Phase V, "Old Ironsides" adjusted its positions in an assembly area West of Jonesboro, La., conducting recovery and maintenance on the many vehicles. Division Artillery moved to areas immediately North of the Red River in preparation for supporting the 3d Infantry Division during the initial stages of the new tactical phase.

As Phase V began on 28 November, the 1st Armored, continuing its role as reserve for III Corps, prepared to cross the Red River on multiple crossing sites. The purpose of this preparation was to exploit a bridgehead which was to be established by the 3d Infantry Division.

Forward positions at this time were occupied by the 1st Armored Division Artillery. Their mission was to reinforce the Division Artillery of the 3d Infantry Division during the period of the assault river crossing.


ARKANSAS
LOUISIANA
LEGEND
U. S. Forces Area
Aggressor Forces Area
Shreveport
Red River
Ruston
Monroe
Jonesboro
MISSISSIPPI
Many
Kisatchie
Peason
Alexandria
Leesville
Calacacieu
Neame
Ludington
De Ridder
TEXAS
TRUCE ZONE
Baton Rouge
New Orleans
Lake Charles

Situation as of midnight 14 November.

The Division's three combat commands were arranged in elongated assembly areas, ready to move at a moment's notice to refueling areas located within an hour's march distance from assigned bridge sites. On 30 November plans were initiated for movement of the Division across the Red River on three bridges.

As Combat Command C began its crossing, an Aggressor atomic weapon knocked out one of the bridges, necessitating an immediate change in plans. During this period all three bridges were rendered unusable for given periods through Aggressor's use of atomic weapons.

The mammoth task of redirecting traffic and rerouting whole commands and portions of commands was accomplished through issuance of orders and instructions by a command control element. This element was operated jointly by the Division's G3 section and the Provost Marshal.

Reporting to the command control

U. S. Army

Aggressor troops with jeep mounted recoilless (106mm) rifles at a halt.

U. S. Army

An M47 medium tank "knocked out" of action by simulated artillery fire.

headquarters was accomplished through both Military Police and command channels. Through this operation all combat elements of the Division effected the Red River crossing and engaged in marching to contact with Aggressor.

By 1 December the weather was playing an important part in Exercise Sagebrush. Rain turned dirt roads to soft mud, causing slippery surfaces and reduced visibility. This created hazardous conditions and slowed down advances.

Nonetheless, the 1st Armored Division passed through the 3d Infantry Division's area and advanced twenty miles to the South with three combat commands abreast. This was accomplished despite Aggressor's skillful delay on canalized avenues of approach into their positions.

As the advance continued the three combat commands experienced different problems in maneuvering through the Louisiana countryside. Combat commands B and A had difficulty

U. S. Army

Tanks and heavy equipment cross a pontoon bridge constructed under cover of darkness during the Red River crossing.

U. S. Army

Matador used for simulated delivery of atomic weapons.

U. S. Army

Crane used to dismantle T2 bridge from creek crossing.

U. S. Army

An aggressor parachutist gathers up his equipment after being dropped behind the "lines" of the U. S. Forces.

crossing the many streams in the East and West zones of the Corps sector. Combat Command C, on the other hand, made good progress through the highly trafficable Peason Ridge area in the center zone.

Combat Command C gained momentum over Combat Command A, as the two advanced South. And Combat Command B was completely stopped by difficult terrain, inadequate bridges and byways made impassable by mud.

During Combat Command A's drive South, this element of the Division was rendered ineffective by an atomic strike from Aggressor. The 100th Tank Battalion, reinforced with units of the 13th Tank Battalion and 702d Armored Infantry Battalion, assumed control of Combat Command A's sector and continued the mission.

Combat Command C was delayed all this time along Calacacieu Creek by impassable bridges and resistance from Aggressor. The unit eventually speeded its advance and occupied Leesville, La., just North of the truce line. It effectively controlled the road net radiating from the town.

In the final stages of Phase V, the 1st Armored Division continued to advance to the South in the West portion of the Corps zone. Combat Command C drove as far South as Neame. The 100th Tank Battalion was ordered to the Division's reserve where it occupied blocking positions to control the Leesville road net.

Combat Command A was reconstituted while the depleted units of the 13th Tank and 702d Armored Infantry Battalions were replaced. Combat Command B continued to attack through heavy Aggressor counterattacks. The 3d Infantry Division was ordered to pass through Combat Command B, and continue the attack in the zone that had previously been assigned to this unit.

The 1st Armored fired two atomic missiles on Aggressor's tank and rifle divisions' command posts, all located East of DeRidder. Subsequently an announcement was received from III Corps that Phase V was terminated as of 1800 hours on 4 December.

The lessons learned by commanders at all echelons in relation to the employment of Armor could have a profound effect on the doctrine, tactics and techniques of future warfare conducted by the United States Army.

The true value of the exercise is obvious. It well justifies the continuation of such maneuvers in the future. The soldier learns by doing and by evaluating his actions. Hence, the importance of the 1st Armored Division's participation in Exercise Sagebrush will remain apparent in current thinking for a considerable time to come.

FROM THESE PAGES

65 Years Ago

Finally, about noon, the First Cavalry found its progress checked by a particularly vicious nest of sharpshooters, snugly ensconced behind a line of fallen logs surrounded by thick brush, on the farther side of a cleared field. After considerable firing our men managed to occupy some out-buildings within about two hundred yards of the annoying position, where the parties amiably pegged away at each other with no very definite results on either side.

While this was going on an officer of Custer's division galloped over from the left, with the information that Custer's line was about to charge to clear his front, and good-naturedly suggested that it would be a good opportunity for us to join in and "clean out" the force which was making so much trouble for us. The suggestion was a good one, but for charging we preferred to be mounted. So the horses were brought forward a few at a time, and the men being gradually withdrawn from the firing line, were mounted and formed in the shelter of the cluster of out-buildings. Everything being in readiness, and sudden cheers to the left indicating a movement of Custer's line, the squadron burst out from behind the sheltering buildings, and with cheers—trumpets sounding—rode straight for the barricades in its front. The attack was unexpected; the nerves of the hostile marksmen lost their steadiness, their fire was delivered in a straggling and ineffective manner, and before they could reload we were upon them.

The charge was well supported by the reserve squadron, and without check was continued up to the very face of the well constructed earthworks of the enemy's main position.

CAPTAIN MOSES HARRIS
First Cavalry

With the Reserve Brigade

50 Years Ago

An army in the field must necessarily be composed mainly of infantry. The destructiveness of rifle fire has been demonstrated in modern warfare so effectively that the infantry weapon is recognized on all hands as the arm which turns the tide of battle. All strategy aims at the throwing of an army of infantrymen at some weak spot in the enemy's defense; and all tactics resolve themselves into the effort to bring preponderating rifle fire to bear at the decisive point.

* * *

The functions of cavalry in regard to infantry may be divided broadly into three heads, under one of which it will be found are included all the various duties required of the mounted arm. These are (a) to show the infantry where to strike, (b) to protect the vital lines of supply whilst the infantry fights, and (c) pursuit of a beaten enemy. Unaided by the eyes of the cavalry, slow-moving infantry is impotent to perceive a weakness in the enemy, and, unprotected by a wing of cavalry, its flank may be circled by opposing cavalry and the communications broken. Briefly, cavalry scouts for an army, on the alert against attack are ready to search out a crevice in the armor of the opponent. It need hardly be added that during operations it is necessary for cavalry to hold its own against opposing cavalry by fighting.

REPRINTS AND TRANSLATIONS

The Cavalry Lesson of the War

25 Years Ago

Discussions of tank actions or defense against tanks should be based on certain assumed characteristics of the future tank; for the purpose of the present discussion they are:

a. Invulnerability to anything but a direct hit by artillery.

b. A maneuvering speed of from 10 to 60 miles an hour on any terrain over which the tank can operate at all.

c. A radius of action and freedom from mechanical faults equal to those of the present automobile.

To anyone who has followed the recent developments of the track-laying or the combination wheel and track vehicle, both in this country and abroad, it will be evident that these assumptions are by no means visionary and that there will be tanks with these characteristics or with characteristics closely approaching them in our next war. It is high time for us to develop some ideas for their tactical use in both offense and defense.

In another paper the conclusion is reached that a mechanized force, as a separate arm, is a weapon of the army commander and that he will use it in attack in the direction of the main blow of his army, and against objectives well in rear of the objectives of his infantry divisions. In considering the defensive it is necessary to realize that fast tanks will also be present in the attacking divisions and corps, and that defensive measures must be taken along the whole front of an army position, as well as on any exposed flank, excepting only on those portions which the terrain makes obviously impracticable for tank maneuver.

LIEUTENANT COLONEL K. B. EDMUNDS

Defense Against Tanks.

10 Years Ago

"It soon became apparent that short unsupported span treadway sections were our most important bridge, and were a tactical success due to the rapidity with which antitank obstacles could be crossed." German top-ranking officers subscribed eloquently and at great length to this fact, when, after capture they confessed their complete surprise and consternation at the speed of the engineer elimination of obstacles which permitted impatient American tanks to repeatedly nip and slice off the tail ends of retreating German columns. It is not surprising that this marvelous piece of bridging equipage is rated by many top Allied commanders as one of the principal items of tactical equipment contributing to our final victory.

To Major General Lunsford E. Oliver, now on Army Ground Forces Staff, goes much of the credit for the development of the treadway bridge. As Armored Force Engineer, in the early stages of the expansion of the Armored Force, he, realizing the urgent need for a military bridge capable of being transported by the armored engineers in the fast moving, highly mobile armored division, successfully pushed to completion the adoption of the now famous bridge.

* * *

The Armored Engineers

CARDED

HISTORY, TROOP ESPRIT

By BRIGADIER GENERAL PAUL M. ROBINETT, USA-Retired

THE value of history in military education has always been recognized in the armed forces of the United States. It has been at the very base of instruction in the United States Military and Naval Academies and the service schools and colleges since their inception. In this emphasis on the value of history in military instruction, the American armed forces have followed the advice of such great captains as Frederick the Great and Napoleon, as well as others who have more recently made their mark on the pages of history. Napoleon has written, ". . . the knowledge of the higher arts of war is not acquired except by experience and the study of history of wars and the battles of great captains." General George S. Patton, Jr., one of America's great offensive battle leaders, also emphasized the importance of history. His words, written on the battlefield, were: "To be a successful soldier you must know history, read it objectively —you must (also) read biography and especially autobiography. If you will do it you will find war is simple."

There are dissenters from these points of view, however. Field Marshal Wavell, for one, holds that the study of psychology and leadership is of greater importance to a military man than the study of operations, contending that Napoleon's military success can be attributed to his knowledge of psychology rather than to his study of rules and strategy. And Le Bon, who was not a military man, has condemned histories on general principle, observing that "They are fanciful accounts of ill-observed facts accompanied by explanations the result of reflection" and that the writing "of such books is a most absolute waste of time."

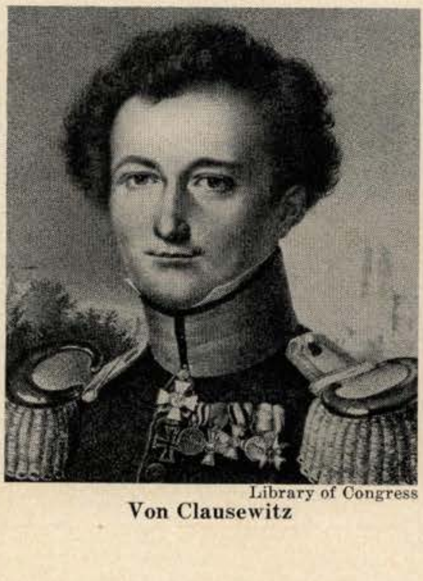
Notwithstanding these opinions, which are not without value as a challenge to historians, it must be concluded that the study of past wars is fundamental to preparation for the next, for current military problems cannot be solved without an understanding of the past from which they stem. Every individual in the military service will find a knowledge of military history, and especially of American military history, valuable in the solution of problems, both in peace and in war. Heeding the inscription carved in stone at the entrance to the National Archives—"What is past is prologue"—the soldier, sailor or airman must be rooted in the past to understand the present that he may project himself into the future.

Esprit de Corps

The accomplishments of the armed forces of the United States in both peace and war have been so outstanding that every soldier, sailor or airman can gain inspiration from the record of the past even though it is still imperfectly told. During the comparatively short span of American history, the Army has fought brave and skillful soldiers of many races and in many lands. These operations have ranged from desperate hand-to-hand engagements with savages equipped with bows and arrows and tomahawks or spears and bolos to vast battles with armies landing in the face of modern forces and driving them back to the center of empire. During the same time the Navy has effectively supported American foreign and military policy, won great naval victories at sea and insured the safety and lodgment of ground forces on many distant hostile shores. And in later times the Air Force has overcome the enemy in the air and successfully supported both the Army and the Navy. The armed forces have also played an outstanding role in discovery and exploration; in great engineering undertakings that have joined the oceans, developed ports and harbors, harnessed and controlled rivers, and developed the atomic bomb; in medicine and hygiene; and in communications, navigation and aviation. They have also been the training ground of scholars, scientists, administrators, educators, diplomats and statesmen who have made great contributions to every phase of American life.

Clausewitz has said that "One who is seeking a profound understanding of the fundamentals of war . . . must understand *esprit de corps*. This spirit is the cement which binds together all qualities which taken together gives an army military value."

A knowledge of their accomplishments can play a vital role in the Army, Navy and Air Force, for as Fortescue, the eminent British mili-


Library of Congress
Von Clausewitz

U. S. Army
Craig

BRIGADIER GENERAL PAUL M. ROBINETT, Retired, a frequent contributor to *ARMOR*, served with the 1st Armored Division in North Africa during World War II. He is the Chief, Special Studies Division, Office of the Chief of Military History, Department of the Army.

DE CORPS AND MORALE

Military history must emphasize leadership and followship.

tary historian, has said, "Without knowledge of military history men are really unconscious of the existence of the most wonderful of moral forces . . . ; and it is not a thing of which anyone can afford to be ignorant." In line with Fortescue's warning the armed forces of the United States have called upon military history in many ways. In the Army, for example, the Information and Education Program includes instruction in the heroic deeds and accomplishments of individuals and units, and each soldier is furnished *The Soldier's Guide,* containing historical material. In many units mounts and vehicles have borne the names of distinguished soldiers of the past. Army posts are generally named for widely known military men; buildings and streets for others or for military organizations. Army and Marine Corps colors and standards are decorated with streamers carrying the names of battles or campaigns in which the unit has honorably participated. In the Navy many ships have been named for officers and men who have distinguished themselves in the service of their country. The Air Force has also named most airfields for distinguished flyers, many of whom lost their lives as pioneers in the air. For many years *Retreat* has included the *Star Spangled Banner* which was inspired under the "rocket's red glare." Thus it can be seen that the deeds and records of the past have been welded to the task in hand and the forces-in-being motivated to live and function in the best traditions of the past.

Morale

In speaking on morale in modern war General of the Army George C. Marshall once said:

> The soldier's heart, the soldier's spirit, the soldier's soul, are everything. Unless the soldier's soul sustains him he cannot be relied on and will fail himself and his commander and his country in the end.
>
> It is not enough to fight. It is the spirit which we bring to the fight that decides the issue. It is morale that wins the victory.
>
> Morale is the state of mind. It is steadfastness and courage and hope. It is confidence and zeal and loyalty. It is *elan, esprit de corps* and determination.
>
> It is staying power, the spirit which endures to the end—the will to win.
>
> With it all things are possible; without it everything else: planning, preparation, production, count for naught.

U. S. Army

Patton

U. S. Army

Marshall

As can be seen, General Marshall's ideas of morale do not include "pie in the sky" or recreation. His thoughts are of the spiritual attributes which motivate individuals who collectively make up a unit and the Army, Navy and Air Force.

General William T. Sherman has given his views on the importance of the spiritual side of the Army in these words: "There is a soul to an army as well as to individual men, and no general can accomplish the full work of his army unless he commands the soul of his men, as well as their bodies and legs." General Patton, a profound student of military history and leadership, on many occasions during World War II also noted the unit soul physically symbolized by the colors and standards.

It can thus be seen that both Sherman and Patton broadened the concept to include the unit as well as the individual in the broader problems of morale. They thought of the individuals of a unit welded together by a leader and given a common soul. The creation of this unit soul is the continuing problem of all commanders from the lowest to the highest and the problem becomes more difficult when for reasons of economy the props which support a commander are abolished. But, regardless of handicaps, the quality of a leader is the true criterion of the soul of a unit. He is the one who must inspire the individuals of the outfit and weld them into a whole capable of withstanding all hardships and sacrifices, so beautifully illustrated by Captain Nathan Hale as he stood on the enemy's gallows on the morning of 22 September 1776 and said: "I only regret that I have but one life to lose for my country."

At the very base of the problem of morale is patriotism or love of country—the cement that binds a people together and sustains their fighting men. Without it neither the people nor the armed forces have a soul. The founders of the Republic laid a solid spiritual foundation for all Americans in two great documents—*The Declaration of Independence* and *The Constitution.* In these fundamental papers are recorded the ideas and principles upon which patriotism in the Republic must be built. Accordingly, every man who enters the military service must swear or affirm that he will defend *The Constitution* against all enemies, foreign or domestic. This solemn ceremony is surrounded with all pomp and circumstance possible under prevailing conditions.

In writing about patriotism General Ian Hamilton of Great Britain said that it is "A plant whose best nutriments are blood and tears: a plant which dies down in peace and flowers most brightly in war. It does not calculate, does not profiteer, does not stop to reason: in an atmosphere of danger the sap begins to stir; it lives, it takes possession of the soul." A truly great military historian will attempt to capture and record this spirit which plays such an important role in the outcome of battles, campaigns, and wars. A mere recitation of events will fail to probe the depths of the services and will prove of little value to leaders of men.

Role of Intangible Symbols in Developing Morale

Intangible symbols of the unit's past consist of customs and traditions around which the outfit builds distinctive special observances and practices. Such things can be of great morale value in the armed services. Examples of these are almost endless in number and variety. Some of the most widely practiced are the celebration of important unit anniversaries, minor distinctions of drill and command, and distinctive greetings and replies. For example, an individual of the 13th Cavalry Regiment on receiving an order or instructions used to salute and reply before departing, "It shall be done." The 7th Cavalry Regiment once included saddled but riderless Comanche, the lone survivor of the Battle of the Little Big Horn, in its parades. In 1922 the 3d Infantry Regiment was granted permission to march on all ceremonial occasions with fixed bayonets in honor of its gallant assault with the bayonet at the Battle of Cerro Gordo on 18 April 1847.

Commodore Oliver Hazard Perry, a naval hero beloved by the Army, knew the value of symbolism and history. After building a fleet on Lake Erie during the War of 1812, he named his flagship for an earlier hero, Captain James Lawrence, and put out a blue bunting flag carrying Lawrence's last words, "Don't give up the ship!" With a crew of soldiers and sailors he defeated the British fleet in a terrific battle and sent a laconic message to Major General William H. Harrison, "We have met the enemy and they are ours." Then after transporting Harrison's force across Lake Erie, he joined it ashore and participated in a cavalry charge that clinched an important American victory in the Battle of the Thames. The Army has named a camp in Ohio in memory of Perry. The Navy has named a ship for him, and all entering midshipmen at the United States Naval Academy are sworn in and take their oath of allegiance directly beneath his flag, which is on permanent display in Memorial Hall.

Lieutenant General Winfield Scott was a colorful leader with ability to express himself in words that have become the heritage of units that once served under his command. After the fall of Chapultepec, 13 September 1847, the 3d Infantry Regiment was put at the head of the column making formal entrance into Mexico City. Mounted with his staff, General Scott waited for the procession in the outskirts. When the 3d Infantry came abreast, Scott, in a dramatic gesture, swept off his hat and said to his staff, "Gentlemen, take off your hats to the Old Guard." This nickname has persisted and is in use today. On the same occasion he addressed the Regiment of mounted rifles (presently known as the 3d Armored Cavalry Regiment, stationed in Germany) as follows, "Brave Rifles! Veterans! You have been baptized in fire and blood and come out steel." Since that time the Regiment has proudly called itself "Brave Rifles" and its unit insignia is emblazoned with that name.

The 13th Infantry Regiment earned its name "First at Vicksburg" as a result of the gallantry displayed by the 1st Battalion on 19 May 1863. On that day, in a frontal assault the 13th planted and maintained its colors on the Confederate parapet for as long as the attack persisted. In doing so it lost 43.3 per cent of its men. Authorization for the unit to inscribe this motto on its colors came from a board of officers of the XV Corps on 12 August 1863.

The 19th Infantry Regiment has for its motto, "Rock of Chickamauga." It earned this name while serving in the corps commanded by Major General George H. Thomas in the Battle of Chickamauga. Stationed on the left of General Thomas' line on 19 September, the regiment bore the brunt of the fiercest assaults. The next day, when their ammunition was exhausted, the men held their ground with bayonets. Seventy-five per cent of the regiment were killed or wounded. At length the command devolved on a second lieutenant. To commemorate this incident, it later became the custom for the junior second lieutenant of the 19th Infantry to command the regiment on each organization day, 20 September.

Another example originated with the proud remark of an unknown soldier during the Civil War. During that war certain corps had adopted distinctive badges, a custom which has continued in the United States Army. But the XV Corps, commanded by Major General John A. Logan, had not done so. One of the men of the corps, on being asked what his badge was, replied, "Forty rounds in the cartridge-box, and twenty in the pocket!" On hearing the story General Logan promptly adopted the cartridge-box and forty rounds as the corps badge.

The unusual form of the Marine officers' sword stems directly from the scimitar and memorializes the heroic service of a small Marine force in the Tripolitan War.

One of the most effective intangible symbols is a unit march or song, particularly one that has been associated with the outfit for a long time. The 7th Cavalry's *Garry Owen* is an example of a song that has contributed materially to the morale of that regiment for many years. Perhaps the most famous of the Army's branch songs is Lieutenant Edmund L. Gruber's *The Caisson Song. Anchors Aweigh!,* the *Marines' Hymn,* and *The United States Air Force Song* are service wide songs that have great morale value. In a much more important way, however, *The Star Spangled Banner* and *Battle Hymn of the Republic* have played an outstanding role in developing morale in the armed forces since they appeared.

Role of Unit History in Developing Morale

The color-bearing units are the military families within which the broader soul of the Army and Marine Corps is built. It is these families which the division commander, without infringing upon subordinates, welds into a composite team. These units are corporate entities having a legal existence even though their actual personnel may vary from war strength when on active service to zero when on an inactive status. Therefore every unit has its own history which is distinct from all others. It may have a history extending back before the founding of the Republic, a brief history, or, in the case of new units, no history at all. In any case, however, each unit shares the broader history of the particular service. Any unit, therefore, can utilize pride in past accomplishments to foster soldierly conduct, pride of outfit and love of country. Newer outfits, like younger brothers, should strive to excel their seniors.

Military Biography and Memoirs and Leadership

Leadership being the very foundation upon which morale, *esprit de corps* and a successful military career must be built, it behooves all officers to study it assiduously, for as Major General Freytag-Loringhoven in his book, *The Power of Personality in War,* has said, "There is no profession in which personality training is more important than the military." The study can best be undertaken by gaining an understanding of the general principles of leadership and then by critically reading the biographies and memoirs of military leaders with a view to determining the reasons for their successes and failures. But it should be understood that the qualities and methods of others are unique to the individuals concerned and are not entirely suited to any other. Nevertheless, they can teach an individual of judgment what to avoid and what to emulate, and can help him shape and develop his own qualities for the better. To do so, however, it is essential that the individual add the experiences of others to his own and acquire qualities and methods suited to himself.

Even though there is a paucity of good biographies and memoirs, particularly of individuals in the lower echelons of command, this material is the best available for an understanding of character, of the characteristics of men, of good and bad leadership and of the influence of eminent personalities upon events. Military works *dealing with the rank and file,* such as Bolton's *The Private Soldier Under Washington* and Wiley's *Billy Yank,* should be read with the realization that bad soldiers tend to leave many documents behind them, while good soldiers ordinarily leave only the briefest sort of records or merely a name. For this reason even so-called "factual studies" of the fighting men are usually heavily loaded on the seamy side of life.

If the study of leadership is to be profitable, the student must analyze, evaluate and judge the qualities of both fighting men and leaders, with due regard to the circumstances and conditions under which they worked. But as the British Scholar, Wilkinson, in his book *The Brain of the Army,* has said, "This judgment must never degenerate into mere negative criticism. . . ." It should enable the thoughtful student to determine and to identify in others the desirable traits of soldiers and leaders in both staff and command positions. This should enable a military man to become a practical psychologist and should thus enable him to avoid becoming a mere theorist. As Clausewitz has pointed out, a commander "need not be a close observer of men, a sharp dissector of human character, but he must know the character, the feelings, the habits, the peculiar faults and inclinations of those whom he is to command."

To be of maximum value in teaching military leadership, historical works must be factual and frank. Propagandistic or censored history is dangerous and should not be used, for it can provide no sound lessons or basis of professional training. It leads to false conclusions and fosters one of the worst evils in professional military thinking—self-deception. Histories written during the lives of the actors or too near their era are generally tinged with prejudice, colored by self-interested flattery and influenced by the selective treatment of source material. Histories written too long after the time of the participants are frequently fictional or sentimental. Therefore, history will never be entirely satisfactory for instruction in leadership until it gives a complete picture of the participants—their merits, faults, temperaments and ambitions, their Janus faces, their ability to exercise self-control especially in adversity and their physical and mental conditions.

Although the study of great captains is important to all military men, the study of "followship," as exemplified by subordinate leaders and staff officers, is equally important and perhaps more so because few can rise to the topmost position and even these must pass through the various grades in both staff and command assignments. General Malin Craig, former Chief of Staff of the United States Army, emphasized this aspect of a military career in this advice to a graduating class at the United States Military Academy:

> No young officer can be unconscious of the impression he is making on others. He would be wrong to govern his conduct solely by the opinions of others. First of all, he must to himself be true. Fortunately, by a happy paradox of human nature, we best serve ourselves when we think only of serving others. An officer . . . should make it a cardinal principle of life that by no account of commission or omission on his part will he permit his immediate superior to make a mistake. Once an officer establishes such a professional reputation his future is assured. His services will be eagerly sought and his assignment to duties of the highest importance is certain.

A comprehensive knowledge of military history emphasizing both leadership and followship will facilitate mutual respect and understanding in the armed forces; the broad problems of the higher commander will be more readily comprehended by subordinates, and the complex human, material, and physical problems of the soldier and of the small-unit commanders better appreciated by superiors. Such understanding will greatly facilitate good morale in any organization.

CARDED

For generations, the Rhine River has been crossed by armies.

However, this is the first time that APCs have been the assault crossing craft.

RIVERS ARE NO LONGER OBSTACLES

By COLONEL LOUIS A. HAMMACK

SINCE time immemorial armies have been faced with the problem of crossing major water obstacles. Modern military development has finally devised a vehicle that provides an answer—the M59 Armored Personnel Carrier.

The techniques of water crossings are well known to those of us who have participated in or who have studied such operations during World War II or Korea. From these experiences we have inherited three key considerations which have become increasingly critical as firepower capabilities are expanded. These are:

1. The concentration of assault crossing parties and engineer equipment on the near bank. 2. The need for a rapid build-up on the hostile side. 3. The ever increasing casualties incurred by the assault waves in a defended crossing.

Faced with the problem of an assault crossing of the Rhine River during a field training exercise, 7-9 September 1955, Combat Command "A," 2d Armored Division, demonstrated the exceptional capabilities of the M59 in providing a solution.

The concept of the operation: Combat Command "A," supported by Unit "M" of the U.S. Navy Rhine River Patrol and the 3d Armored Field Artillery Battalion, crossed the river at three sites to establish a lodgement of the East bank of the Rhine River. *[See Figure 1.]* Available M59s from the three battalions were organized into three assault groups comprised principally of the Battalion Reconnaissance Platoons. These units were given the mission of securing initial bridgeheads for each of the crossing sites.

No enemy forces were West of the river in this particular sector. The terrain on the East bank of the Rhine river is low, level and consists of small wooded areas, cultivated fields and small villages. The terrain East of the escarpment and West of the river is low, open and level. Concealment of the attack position is poor.

During the night, reconnaissance parties established routes to the launching points. At a predetermined hour the assault parties, with supporting tanks, moved in march column from the attack positions; deployed in orchards prior to reaching the west bank, and without pause, at BMNT, rolled into the water. Five minutes later the vehicles gained the east bank after having crossed 300 yards of one of Europe's most formidable water barriers. On reaching solid ground the personnel dismounted and proceeded to establish the bridgehead. When the initial assault bridgeheads were secure the remainder of each battalion began to cross on river craft

U.S. Army

At a speed of four mph the M59 moves across the river to secure the beachhead.

COLONEL LOUIS A. HAMMACK, Armor, graduated from USMA in 1929. During World War II he commanded a tank battalion in Europe. Afterwards he was assigned to Army Ground Forces. Following a tour in Turkey, he was Director of the Weapons Department, TAS. He commanded CCA, 2d Armored Division in Germany until November 1955 when he was assigned to USAREUR headquarters.

of the U. S. Navy Rhine River Patrol.

The results of this training exercise demonstrated to all observers the effectiveness of the M59 Carrier when used as an assault river crossing craft. The operation was conducted without the usual concentration of troops and engineer equipment prior to the embarkment of the assault troops. The near bank of the river was used as a Line of Departure in the normal sense, thus permitting continuous momentum from the attack position to the objective. While in water the carriers, with 13-15 inches of freeboard, presented a minimum target—and that being impervious to small arms fire—for a minimum period of time. Further definite improvements over present methods of river crossings were also noted. The M59 provides a self-propelled .50 caliber machine gun for additional fire support after reaching the far side; more and better communications are provided; command or scout ¼ ton vehicles can be carried across; and the carrier can be used to ferry more troops to the bridgehead area.

Specific training points noted were:

1. The forward speed of the M59 was sufficient to cross virtually perpendicular to a river current of 4-6 knots. 2. The assault vehicles should be echeloned upstream permitting the downstream vehicle to enter the water first. 3. The water must be entered and exited at a right angle to the river bank to prevent one track from hanging on the bottom while the other turns in the water. 4. Care must be used in selecting a debarking site for if the slope is too great the rear of the vehicle will pitch downward and water will enter through the rear exhaust grills.

Undoubtedly the M59 has been subjected to exhaustive tests in lakes, ponds, and small streams. It is felt however that this was the first practical demonstration of the capabilities of the M59 in crossing as formidable a stream as the Rhine River.

The salient point derived from this crossing was that, for the first time in the history of Armor, vehicles now organic to the Armored Infantry Battalion are capable of being used as assault crossing craft. When the Armored Infantry is completely equipped with the M59 we will have added the capability of amphibious assault to the already tremendous potential of Armor.

D plus 2

Combat Command "A" was in mobile defense along west escarpment of Rhine River. Received orders to establish river crossing and continue attack to the east.

0430 D plus 3

Combat elements of TF's closed in attack positions.

Batteries of supporting FA Bn (105mm) were in position just to rear of attack positions to support the crossing.

Supporting tank platoons (90mm) for each crossing site were in position on west bank of river.

0515 D plus 3

Assault crossings of river at each of three sites by M59 assault groups commenced. Each assault group supported by one tank platoon, one FA battery and one flight of tactical air on call for any of the three sites.

0630 D plus 3

Initial assault bridgeheads at each site established and crossing of combat vehicles of each TF commenced.

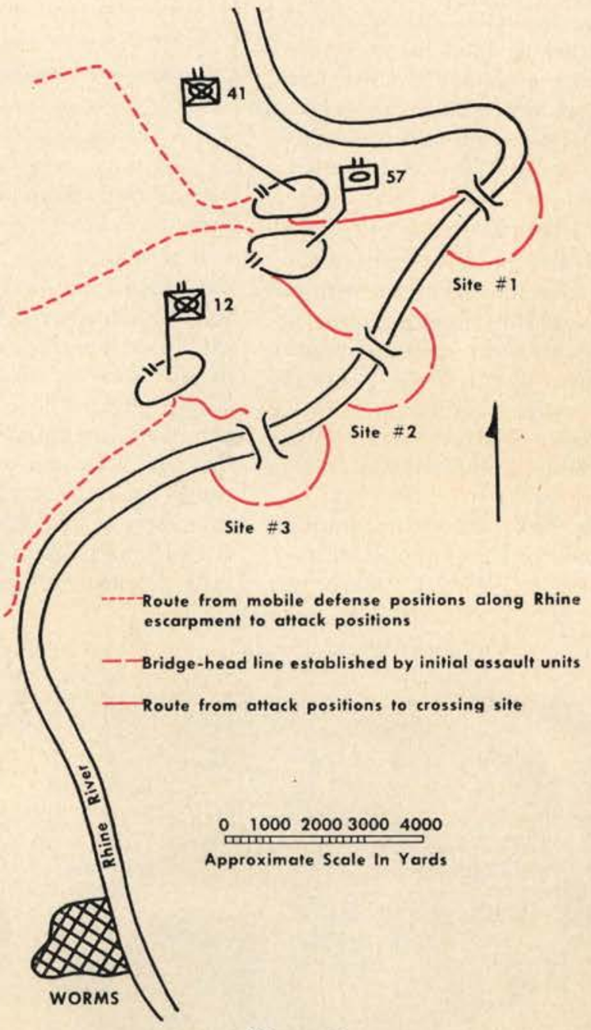

41
57
12
Site #1
Site #2
Site #3
----- Route from mobile defense positions along Rhine escarpment to attack positions
— — Bridge-head line established by initial assault units
—— Route from attack positions to crossing site
0 1000 2000 3000 4000
Approximate Scale In Yards
Rhine River
WORMS

Figure 1.

The Evolution of . . .

CARDED

SOVIET ARMOURED PRINCIPLES

By GUARDS MAJOR M. F. VASSILIEFF

THE adoption of tanks as part of the armament of Soviet armies is a story in itself. Before 1928 the Red Army possessed no tanks of native manufacture; there were only a few dozen captured tanks remaining from the time of the civil war. In 1927 the first tank school was opened, to train an establishment of officers of intermediate rank. In Leningrad in 1930, refresher courses were started to prepare officers and tank crews; and in 1933 there was founded in Moscow the *Stalin Academy of Motorisation and Mechanisation of the Workers' and Peasants' Red Army*.

Up to 1940 the quality of the tank forces of the Soviet Army was remarkably low in comparison with foreign armies. But already despite the comparatively short space of time for development, the basic designs of the tanks of native manufacture—for example, the T-34, KV-1 and KV-2—were far better in quality than foreign models.

During this same comparatively short period of development of tank forces in the U.S.S.R., there was worked out a harmonious system for their employment in battle.

This informative article is reprinted with the kind permission of the editor of *An Cosantoir*, The Irish Defence Journal. Major Vassilieff is a former staff officer of the 4th Tank Army of the U.S.S.R. It was translated by Captain D. N. Brunicardi, Irish Army Headquarters, and appeared in *An Cosantoir* this past October. The picture illustrations are supplied by *ARMOR*.

It should be noted that, as regards the use of tank forces in battle, military thinking in the U.S.S.R. was still based on the experience gained *in the Russian Army* in the First World War. The ideas then prevalent were strengthened by the fear that in a future war the struggle would again take on a tight positional character, as happened in the years 1914-18, and that a penetration of a deep defence could not be achieved, for the reason that the tempo of attack would be slower than the speed of concentration of defence reserves coming up to "seal off" the tactical break-through. The experience of the first successful tank actions fought on the Western Front in 1917-18, however, gave rise to the opinion that it was, in fact, the tank which would prove to be the means of turning a war of position into one of movement. The availability in Russian translation of the works of the well-known theorists on tank warfare, Fuller and Aymansberger, was responsible to an important degree for the emergence of these views in military thinking in the U.S.S.R.

It should be said that, before 1931, the battle role of tank forces, considering the technical resources available in the U.S.S.R., clearly underwent a reassessment. At that time the theory in vogue was to impose on the tanks the task of operating independently deep in the rear of an enemy, and to a great degree separate from the forces conducting the frontal attack; the conviction grew that the idea of organising massive tank arm-

The T34 Medium Tank

U. S. Army

The KV Heavy Tank

U. S. Army

ies to act in the operational rear of the enemy was the correct one, and this was vindicated in the course of the 1939-45 war, especially in the closing stages.

The 1931 Manoeuvres

In 1931, in the region of the town of Bobruisk, were held the first "all-arms" manoeuvres on the grand scale. On the basis of the experience of these exercises, and of the study of other great military exercises of the period 1931-33, the General Staff of the Soviet Army were enabled to provide for that era a very satisfactory solution to the problem of the role of tank units in battle. Further, as already indicated, the lessons of operations in the West in the First World War and of the great military exercises of 1931-33, were accepted in the Soviet Union.

It had already been remarked at that time that the tanks, due to technical imperfections, were little adapted to surmounting without assistance a system of artificial obstacles incorporated in a completely-organised defence belt, where that system included antitank artillery weapons. There remained, therefore, the chief task (before branching out into the operational field): it was necessary to effect a breach in any powerfully-developed tactical defence so as to launch the attacking infantry.

During the years 1932-33 the General Staff of the Armed Forces of the U.S.S.R. set before itself the task of including in the Order of Battle, for the purpose of achieving a breakthrough, three groups of tanks:

(a) those which would give immediate support to infantry (Russian initials, N.P.P.);
(b) those which would give distant support to infantry (D.P.P.) and
(c) those intended for distant action (D.D.).

Contemporaneously with this, during the period from 1931 to 1937, a maximum allotment of tank units to the forces was laid down. Thus, for example, in the establishment of a rifle brigade there was included a light tank battalion; in that of a rifle division, a heavy tank battalion. At that time, too, purely tank formations were being created, brigades, divisions and corps and later even complete tank armies.

Battle-Planning

In the Soviet Army battle-plans for infantry and artillery groups, the following tank tasks were defined:

1. *N.P.P. (Close Support) Tanks.* The normal allocation was one tank company to each rifle battalion of the first echelon. These tanks were to engage the fire positions on the forward edge of the enemy defences. The infantry were to move up immediately after the tanks, separated from them by only 150-200 yards, right up to the point for going into the attack. When the infantry had advanced to a depth of 800 to 1000 yards, the N.P.P. tanks were to regard their task as completed and draw off to an assembly point, chosen, usually, on the line of the former forward limit of the enemy defence, covered from enemy artillery fire.

2. *D.P.P. (distant support) tanks.* The normal allotment was two or three companies to the front of each rifle brigade in the attack. These tanks were to throw themselves directly on to enemy company and battalion centres of resistance at a depth of 1 to 1½ miles from the forward limit of the defence and there engage machine-gun batteries, observation posts and single guns disposed through the defence system. The second, or shock, wave of the attack was required to co-operate closely with the D.P.P. tanks, whereupon the latter were to be converted into N.P.P., or close support tanks for this second wave.

3. *D.D. (distant action) Tanks.* The normal allotment was one or two battalions (not more than two for medium tanks) as the attack unit of a rifle division. The D. D. tanks, moving out from a start-line, were to pass ahead of the infantry and other tanks, not delaying to neutralise the separate points of resistance, but pressing on deep into the enemy gun area, with the object of overrunning the artillery and command posts.

The artillery was to fulfill its task in relation to distant and close support tanks by sheltering them from the artillery and antitank fires of the defenders, maintaining *a curtain of fire* in front of the advancing tanks. On the flanks of the axis of advance, the artillery were to put down either a "mobile blocking fire" (PZO), or "fixed blocking fire" (NZO), the initial suppression of the fire system of the defenders taking the form of an artillery preparation lasting from 30 mins to 1½ hours. At the end of the preparation an air raid was to be laid-on along the forward limit of the defence. From the beginning of the infantry attack the artillery would shift its fires on to the enemy rear when it acted in the interests of the close and distant support tanks.

These Soviet Army plans for the employment of tank groups in penetrating enemy defences, need to be amplified by one remark regarding the theory of employment of tanks for fighting deep in the rear against enemy operational reserves. The mission of fighting these reserves was customarily carried out in the following manner. After the whole "tactical" depth of the enemy had been penetrated and neutralised—that is, when the infantry had penetrated 2 or 3 miles—the D.D. tanks, and sometimes individual D.P.P. tanks, were to gather in one assembly area, the commanders and staffs placing themselves at the head of the assembled tanks. The brigades (or divisions) thus assembled then developed a very deep attack, choosing as objectives the important points in the rear defensive area and the advancing reserves of the enemy.

Characteristic Features

Thus, as was already noted before 1937, the employment of tanks in the Soviet Army was aimed at the simultaneous suppression of all tactical enemy defences up to a depth of about five miles. Objectives situated at a greater depth than this were neutralised by air attack and afterwards suppressed completely by tank forces regrouped for that purpose. As a result of the school study of the employment of tanks in battle according to the established formula, it became clear that there were certain characteristic features, namely:

1. At the time of an attack, tanks were dispersed through infantry tactical groups and, therefore, their chief characteristic—shock power—was, to a great extent, lost.

2. Large formations (brigades and divisions) of tanks, at the very moment of greatest strain in battle, for all practical purposes ceased to exist. The staffs of tank brigades and divisions placed themselves in a some-

what supplementary role on the staffs of rifle divisions and corps, and the staffs of tank corps attached themselves to the staffs of armies in the role of advisers-on-tank-matters to the commander of the infantry formation.

3. Dispersal of tanks along the whole front of the attacking forces meant a like dispersal of artillery. Scattering of tanks in this way led to great losses.

4. The value, however, of gathering together tanks, hitherto disposed through infantry groups, into brigades, with the object of attacking enemy reserves on their way forward remained problematical. Practice showed that, even under the ordinary conditions of training—that is, without the influence of hostile fire—the assembly of a tank brigade required from three to six hours.

General Pavlov,[1] from 1935-37 commander of the 5th Tank Brigade stationed in White Russia, who had participated with a unit of his brigade in battles in Spain (where he was chief advisor on the employment of tanks to Gen. Miaja, commander of of the Republican forces), was considered in the Soviet army to be the unrivalled authority on tank matters. With the support of Stalin he achieved the break-up of some tank corps on the basis of his experience in Spain where small groups of tanks, in the nature of tank battalions, had successfully operated.

The General Staff of the Soviet Army, in the persons of its leaders, the late Marshal Shaposhnikov, Marshals Meretskov, Zhukov and others, opposed this breaking-up of large tank formations. They further insisted on the liquidation, in the system of battle formations, of the attacking N.P.P., D.P.P. and D.D. groups, to give place to a single tank group. This group would act on a divisional front in the attack, would be required to operate with no formation lower than division, be subordinated only to the Corps or Army Commander, and operate according to the Corps or Army plan. Responsibility for fire support of the tank group was allotted to the artillery of Corps or Army, while the group itself was to operate along the main axis of attack for the break-through. The normal allotment of tanks, however, remained as before, that is, not more than two brigades per divisional front.[2]

SovFoto

Soviet conclusion—Tanks should be employed together in the decisive direction.

New Policy

At the end of 1937 and beginning of 1938 a number of instructional problems were worked out on the basis of this type of tank action, in the General Staff Academy, in the Frunze Academy and in the Academy of Motorisation and Mechanisation, and a set of training exercises was produced for the forces. As a result, from 1938 to 1940 this method of employing tanks in one tank group per division was given sanction by order of the People's Commissariat for Defence (Defence Ministry) in place of the previous scheme of dispersal along a front. A massing of tanks on a comparatively narrow but decisive front of break-through, was decided on, by which, at the same time, the fire power and striking power of the tanks would be raised. Secondary sectors either would have no tanks or would be allotted them only in limited numbers.

On the sector of the formation carrying out the main attack, usually a corps of two divisions on a front of 3 to 4 miles, two tank groups, of a strength of from two to three brigades, were to operate. The artillery of both divisions, together with corps and army aviation, were to act in the interests of the tanks, the battle as a whole being planned by the corps staff.

Tank density on the decisive sectors of the break-through was raised to 90 to 120 tanks on a thousand-yard front, whereas the former density on main axes of attack never exceeded 30 to 35 tanks.

The plan, then, on the success of a break-through, was that the tanks, depending on circumstances, either pressed forward to the capture of various objectives in the rear defence areas, or engaged the enemy reserves as they came up, in co-operation with air action and parachute landings. Emerging into the enemy rear, they delivered blows from there, and jointly with the forces attacking in front, wiped out the points of enemy resistance.

Study of this method of employing tanks led certain Soviet army leaders,

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[1] When in July 1941, the forces in the White Russian Military District, in common with the Soviet army in general, suffered defeat, Colonel-General Pavlov, his Chief of Staff, Lieutenant-General Klimovski, and the Chief of Military Communications of the District, Major-General Grigoriev, on the orders of Stalin, were shot as "enemies of the people—for treachery and betrayal."

[2] In the battles in Mongolia, on the Halchin-Goll river, a reinforced brigade of this sort, under Yakovlev, operating according to the General Staff ideas, decided the whole operation in favour of the Soviet forces.

SovFoto

Prior to 1937, tanks were dispersed through infantry tactical groups; thus their shock power was, to a great extent, lost.

Marshal Zhukov and others, to devote attention to another problem, namely, that of engaging the enemy reserves far to the rear, especially those which, at the moment of attack, were situated at a distance of 30 to 45 miles away. They came to the conclusion that aircraft was the weapon to use against these reserves, even though it could do no more than slow up their advance. In putting these questions the General Staff of the Soviet Army had already formulated the solution, based on the fact that it is impossible to impose the execution of two tasks on one and the same tank group. And once the necessity for fulfilling the second task was admitted, the solution was seen in the imposition of this task on an operational formation already in the hands of the army or front commander, and distant from the tank group just mentioned, namely, the "break-through echelon" or E.R.P. development.

The E.R.P.

The disposal of this E.R.P. could, as stated, be at "army" or "front" level. Two tank divisions were included in the make-up of army E.R.P. as well as one motorised rifle division. Later when tank corps began to be created in the Soviet Army, such corps were included in the E.R.P. and were strengthened with a motorised rifle division plus covering and supporting units, self-propelled artillery, anti-aircraft batteries, anti-tank batteries, attached engineer and pontoon battalions, signal units and others.

At "army" level the E.R.P. group is brought into battle at the internal junction-point of the two attacking corps; likewise, at "front" level it appears usually at the junction of the two attacking armies of the "front."

Used this way the basic task of the E.R.P. was the extension of the break-through; from the outset it breaks through the rear defense strip (1 mile to 1½ miles from the forward line) and moves on out 20 to 25 miles towards the end of the first day. From the morning of the second day it either re-groups for battle or moves on to block or destroy the approaching enemy reserves. (The latter variant was always adopted if it was observed that enemy tank units were coming up.)

Re-groupment amounts to this, that the E.R.P. forms up to deploy *backwards,* under cover of its motorised rifle division, surrounds the strongpoints of enemy resistance and, in conjunction with the units attacking in front, destroys them. The next operation of the E.R.P. is the capture and retention of the most important objectives—river crossings, main road and rail centres and other places.

Up to the moment of the general attack, the "break-through development echelon" (E.R.P.) is located on its starting positions or jumping-off ground in attack formation. The distance separating the jumping-off ground from the forward limit of the enemy defence is reckoned, in the exemplary case, at from five to seven miles. The time for the entry into the breach made by the other forces is laid down to be when the infantry penetration has attained 2½ to 3½ miles, that is, when the infantry-tank group combination is in possession of the main enemy gun area.

The E.R.P. moves out from the starting place in compact formation, in battle order, in five to seven columns of route, across a front of three to four miles. In the flank columns and at the head of each column move the tank units and self-propelled artillery; the motorised columns occupy the centre, and the staffs follow these. The columns include a limited number of mobile repair-shops, and the necessary supplies of ammunition and fuel. The bulk of the rear echelon remains in the starting area and joins the units only at the end of the second day, and possibly even much later.

Army aviation and artillery of all kinds "sees in" the E.R.P. *putting down interdiction and screening fire.*

Control of Movement

The coordination of movement with the artillery and aviation protection is brought about by sending back observations by radio and communication aircraft.

Often, depending on meteorological conditions, the axis of movement of the E.R.P. on one of the fronts is covered by a complex patrol of fighter aircraft. Besides this, the basic composition of the column includes the anti-aircraft artillery battalions.

The plan for the entry of the E.R.P. into the breach and its plan of action for the subsequent 48 hours provide for careful correlation of the following basic operations:

1. Prolonged reconnaissance, in conjunction with the infantry, artillery and air commanders, of the proposed zone of advance;
2. Careful reconnaissance of, creating camouflage for, and laying-on fire-power for the security of the "assembly" and "departure" areas;
3. The laying-out (which includes preparation of all sorts, engineer as well as administrative) of the roads or routes to be followed by the E.R.P. from the assembly to the starting positions;
4. The reserving of roads and routes and clearing them of other troops, for the E.R.P. to move out on to the starting position and from the starting place forward. This amounts to an administrative order for passing the E.R.P. through its own forces;
5. The plan of action of the artillery for "seeing through" the advance of the E.R.P. into the breach and beyond;
6. The plan of action of aviation for guaranteeing the advance through the rear defenses, that is, cover by fighter aircraft for the attack on individual objectives;
7. The plan of action after the first 24 hours, not only of the units of the E.R.P., but also of aviation and artillery;
8. The plan of supply of fuel, ammunition and food and the plan of evacuating wounded, and the use of aircraft for these purposes;
9. Plan of control in relation to forward and lateral limits and times.

Second World War

During the time of the Second World War, the organisation and tactics of tank forces went through four phases:

1. From the beginning of the Second World War to November 1942.
2. The campaign of the Summer of 1943.
3. The Autumn-Winter 1943, Spring 1944 campaign.
4. From the beginning of the Summer campaign 1944 to the end of the war, May 1945.

The *first phase* is characterised by heavy losses of men and materials in the Soviet Army and the withdrawal to the east. Of tank operations, two may be noted, one in June, 1941, on the south-west front and the other in May-June, 1942, in the Kharkov region.

The *second phase,* that is, the summer campaign of 1943, is famous for the fact that the battle was characterised by stubborn and bloody encounters for every separate tactical objective. In fact, the German front was not penetrated but was gradually worn down. Every foot of ground was contested with the result that the German units disintegrated gradually but inevitably.

A characteristic of the Soviet Army organisational structure of tank forces in 1943 was that there were no large tank formations, a fact which is explained by the lack of the requisite reserves. The basic unit of the organisation at the time was the tank brigade, small in numerical strength, of from 71 to 98 fighting vehicles. A feature, however, that emerged in the battles of 1943 was that certain "tank-borne landings" conclusively achieved their object. These were raids made by parties of "storm" and "block" troops carried on the hulls of the tanks. These detachments were delivered to enemy pillboxes and casemates which they were required to block-up and destroy.

The *third phase* embraces the battles for the capture of Kiev and Korosten, the battles in the Krivoi Rog and Zhitomir regions, on the line of the river Mius, and the liberation of the Crimea and Odessa.

The *fourth phase* begins with the advance of the Soviet forces on the White Russia front and concludes with the battles for the capture of Berlin. This phase is distinguished by the fact that the steadfast resistance of the German forces was broken down. The deep rear of Germany was paralysed and in the end the Second Front was opened by the landing of the allied forces in Western France. The Soviet tank industry developed its greatest productive momentum at this time and the U.S.S.R. was receiving from the U.S.A. a great quantitiy of war material.

Conclusion

The four stages above analysed, through which the tank forces of the Soviet Army passed during the Second World War, show clearly that the Soviet Command had found the correct solution of the problem of the employment of tanks and that they were justified in drawing the conclusion that there is no necessity to disperse tanks along a whole front; they should be employed *massed together in the decisive direction.*

While speaking of the course of military operations carried out by the Soviet army in the second half of the war, it should be said that, beginning with the Stalingrad struggle, the High Command of the Soviet forces put into effect new forms of attack operations, with groups of tanks in formation of many successive echelons in the direction of the decisive blow. This made possible the delivery of blows cutting up the enemy to a depth of 250 to 300 miles, and having a fast tempo of movement—achieving anything from 15 to 20 miles in 24 hours.

At the present time, a tank corps in the Soviet Army shows the following organisational structure:

1. Corps Staff;
2. 4 to 5 tank brigades;
3. 2 regiments of self-propelled artillery;
4. battalion of mortars, 122 mm;
5. Guards battalion of multiple-rocket projectors, "Katyushas";
6. Reconnaissance battalion;
7. Engineer battalion;
8. Anti-aircraft battalion;
9. Signals battalion;
10. Salvage-repair battalion;
11. Medical battalion;
12. Units of the rear (for supply and evacuation).

In the establishment of the tank brigade are included battalions of tank-borne storm-troopers armed with sub-machine guns. The number of fighting vehicles in the brigade varies. There are brigades of 100 vehicles, while other heavier brigades run to as many as 230.

CARDED

The Cavalry Battle at BRANDY STATION

By *FIRST LIEUTENANT WILLIAM V. KENNEDY*

The battle of Brandy Station was an important one for the Union Cavalry—it marked the turning point in its relative efficiency and excellence as compared with its adversary's. It was the first true cavalry combat of the war. Steele's Campaigns.

PISTOL fire, bugles and the cries of startled pickets shattered the morning stillness. Blue clad troopers of the Eighth New York Cavalry charged across the shallow ford.

Sabers bared, the New Yorkers splashed out of the water on the opposite bank of the Rappahannock and swept aside the picket lines of the Sixth Virginia.

Confederate Brigadier General William E. "Grumble" Jones, awakened by the firing at Beverly Ford, tumbled out of his cot. Dressed only in trousers and underwear, Jones got himself and the Seventh Virginia Cavalry into the saddle.

Joining the Seventh to the reserve picket force of the Sixth Virginia, Jones struck the head of the Union column as it rode toward the rear areas of "Jeb" Stuart's command.

Ditches and some of the few fences left in the area confined the fight to a narrow dirt road. Sabers and pistols clashed in the melee of horses and men.

Colonel "Grimes" Davis, commander of the Eighth New York, was struck from his saddle by a Confederate lieutenant.

Troop after troop of the First United States Cavalry Division poured across Beverly Ford in support of the New Yorkers. The Sixth and Seventh Virginia made a brief, gallant stand, then gave way.

Behind them, the Sixth left 30 men in the dust and ditches of the road.

The greatest cavalry battle ever fought on the American continent had begun. The place: Brandy Station, Culpeper County, Virginia. The time: 9 June 1863, from the morning until late afternoon. The antagonists: The Cavalry of the Army of the Potomac under Major General Alfred Pleasanton *vs.* the Cavalry of the Army of Northern Virginia under Major General J. E. B. Stuart.

FIRST LIEUTENANT WILLIAM V. KENNEDY, Armor, is a free lance military analyst and a member of the 104th Armored Cavalry Regiment, Pennsylvania National Guard. Until recently he was on active duty with the Air Force.

The results? Considering the number of men involved, and the violence of the action: Relatively small.

But the lessons. . . . To every man who has ever thrilled to the sight of a yellow guidon—a lesson of inspiration that will live as long as the words *courage, gallantry, dash* and *elan* hold a true and sincere place in an American heart.

And to every man who makes the profession of arms his full or part time occupation—an unforgettable lesson of the importance of individual intelligence, initiative and decision on the part of every participant in a military action, regardless of how insignificant his role may appear to be.

Brandy Station was fought on ground well suited to a major cavalry engagement. It was fought between two highly organized, disciplined and trained organizations under the leadership of veterans. Both sides were as near to equality in equipment, mounts, artillery and morale as they would ever attain.

Whatever edge there was lay with the Confederates. Their almost unbroken record of victory had endowed the troopers in gray with self-confidence and *esprit de corps* which their natural good horsemanship had done much to create and to foster.

Uniformity of equipment, a seemingly inexhaustible store of supplies and replacements and a new policy of improvement fought on the side of the Union horsemen. At Brandy Station these quiet, but mighty, allies showed the first signs of paying off.

Chancellorsville had been fought in the early days of May. "Fighting Joe" Hooker had had enough fighting for a while. He held his Army of the Potomac in waiting across the Rappahannock from Lee, encamped behind Fredericksburg.

Lee, forced onto the offensive by a combination of morale, logistical and political problems, launched the Gettysburg campaign from his Fredericksburg camp on 3 June 1863.

By 8 June, two corps, Ewell's and Longstreet's, had reached Culpeper Court House. Thanks to the screen provided by the Rappahannock, and the activity of Hill's corps, still at Fredericksburg, Hooker remained ignorant of the movement. Fed

"Jeb" Stuart, in command of Lee's cavalry, was encamped at Brandy Station, a few miles east of the advanced infantry at Culpeper. There, on the broad plain that swept down from his headquarters, Stuart, on the 5th and 8th of June, staged two impressive reviews for the edification of General Lee and all the young ladies who could be collected from the surrounding country.

Northern sympathizers from Culpeper told Hooker of Stuart's concentration. The informants crossed to the Union lines too soon, for they reported that Stuart was encamped at Culpeper Court House and that he was without infantry support.

Acting on this intelligence, and without further reconnaissance, Hooker ordered General Pleasanton, commanding the Federal cavalry, to attack Stuart's camps on the morning of 9 June in order to break up what Hooker thought were preparations for a raid across the Rappahannock.

J. E. B. Stuart Fed

Brandy Station, in 1863, lay midway on the Orange and Alexandria Railroad between Culpeper Court House and the Rappahannock River. The Hazel River ran east and west about three miles above Brandy, joining the Rappahannock four miles northeast of the station.

Some four miles south of Brandy Station lay a creek called Mountain Run, roughly parallel to the Hazel and draining into the Rappahannock as the river ran southeast from its confluence with the Hazel.

Half a mile northeast of Brandy Station stands Fleetwood Heights, a long ridge running two miles toward the northwest. Fleetwood commands all the country bounded by the Hazel, the Rappahannock and Mountain Run. It is threatened only by Barbour's Hill immediately to the west.

At the time of the battle, most of the fences dividing the fields around Brandy had been torn down, for use as firewood, by troops operating in the vicinity in previous campaigns. Crops had been planted, however, and fields of clover and wheat and young corn rolled gently from the Hazel to Mountain Run and from Brandy to the woods which hid the Rappahannock, four and one half miles to the east.

Patches of woodland dotting the plain around Fleetwood offered the only cover from a force mounting guns on the Heights, the key to the battlefield.

Dirt roads intersected the countryside. From a central convergence on Brandy, they fanned out again toward the three fords of the Rappahannock: Beverly, Norman's and Kelly's.

Beverly Ford lay one mile below the junction of the Hazel and the Rappahannock. Norman's Ford lay due east of Brandy with Kelly's Ford to the south, two miles above the junction of Mountain Run and the river. The railroad crossed the river between Beverly Ford and Norman's Ford.

Stuart's headquarters were on Fleetwood Heights. In anticipation of the northward movement, scheduled to begin on 9 June, all equipment not needed for the march, including the headquarters files, had been loaded into the wagons.

Five of Stuart's seven brigades were bivouacked on the plains around Fleetwood and across the Hazel. Only Jenkins, in the valley before Milroy, and Imboden, with Hill at Fredericksburg, were absent.

In all, the Confederates mustered 9,536 officers and men with 24 guns, rifled and smoothbore, either detached to the brigades or concentrated in the horse artillery park under Major R. F. Beckham.

Fitz Lee's brigade, operating under Colonel Tom Munford, was camped seven and one half miles northwest of Brandy, on the north side of the Hazel. Next in line came W. H. F. "Rooney" Lee, two miles southwest of the junction of the Rappahannock and the Hazel and four miles north of Brandy.

"Grumble" Jones held Beverly Ford. His pickets extended from the confluence of the rivers south to the railroad bridge with the brigade itself bivouacked on the Brandy road, near St. James Church.

Major Beckham's horse artillery, four batteries, was parked, and its crews bivouacked, in woods to the south of the road, some distance ahead of Jones' brigade. The pickets on the river bank were the only troops between the guns and Federal troops on the eastern shore of the Rappahannock.

Wade Hampton's veterans and Beverly Robertson's fresh brigade from North Carolina were scattered through the clover fields running south from Brandy to Mountain Run. Hampton's men guarded Kelly's Ford with Robertson responsible for the banks from there to Jones' position.

Brigadier General John Buford, of the Northern horse, had been at Warrenton Junction, ten miles northeast of the river at Beverly Ford, since 30 May. His patrols had been active along the river for several days.

Pleasanton brought the main body of the attack force to Warrenton on 8 June. Counting Buford, Pleasanton commanded 10,981 men, including two brigades of infantry under Generals Ames and Russell with five batteries of horse artillery.

Pleasanton's plans called for Buford, commanding the First Cavalry Division, the Reserve Cavalry Brigade and General Ames' infantry, 5,418 men in all, to attack the Confederates at Beverly Ford.

Brigadier General David McMurrie Gregg, commanding the Second and Third Cavalry divisions, with Russell's infantry, a total of 5,563 men, was to attack at Kelly's Ford.

No attack was planned over Norman's Ford, nor was one expected there due to the poor condition of the ford. Neither is there any mention, either in reports or narratives of the battle, of any plans for use of the railroad bridge.

Both assaults were to be launched at daybreak.

Once across the river, Pleasanton's orders were to "march directly to Culpeper" in order to "disperse and destroy the enemy's trains and supplies of all descriptions to the best of your ability."

In his ignorance of Stuart's position at Brandy Station, Pleasanton planned to rendezvous his divided forces at Brandy and proceed from there to the Confederate cavalry camps, supposed to be at Culpeper. The infantry and artillery were to hold open his lines of supply and retreat.

On the night of 8 June, Pleasanton marched to the approaches of Beverly and Kelly's fords. No fires were lit and the blue-clad troopers crept quietly to the banks of the river to await the signal to attack.

On the Confederate side of the stream, Stuart's men rested from the exertions of the day's review. Nothing but a brisk morning ride toward Pennsylvania and its stores of clothing, forage and food appeared to be in prospect.

Buford's attack across Beverly Ford trampled those prospects under the thunder of its hooves.

The hard fighting near the ford must have surprised Buford as much as it surprised the Confederates themselves. Whatever the effect on the opposing commander, the attack threw Stuart's exposed horse artillery into desperation.

Major Beckham, commanding the artillery park, ordered one of his guns dragged onto the road by hand to hold the oncoming Federals with canister. The rest of his men hitched the teams to the guns and galloped for high ground near St. James Church.

Thanks to the brave stand of the Sixth and Seventh regiments at the ford, Beckham reached safety without losing even the gun in the road.

While the Sixth and Seventh were holding Buford, Jones deployed the Eleventh and Twelfth regiments, with the Thirty-Fifth Battalion, in support of the guns as they unlimbered and went into action.

Falling back, the Sixth and Seventh formed on the right and left of this line.

No sooner was the Confederate line formed than the first Federal troopers charged through the deserted artillery park and out of the woods, only to be driven back again by Beckham's guns.

Colonel Harman led the Twelfth Virginia, the Thirty-Fifth Battalion and the Eleventh Virginia into a countercharge. Heavy small arms fire and a line of Union troopers met them at the edge of the woods.

Hand-to-hand fighting ensued. The Federals were forced to give way, leaving several prisoners in Confederate hands.

Stuart, immediately upon hearing the firing from Beverly Ford, had ordered Hampton, except for one regiment, the Second South Carolina, to proceed to Jones' assistance. The wagons were dispatched posthaste to the safety of Culpeper. "Rooney" Lee was ordered down from his position north of the fight.

The Second South Carolina was held in reserve at Fleetwood.

Hampton from the south of the fight and Lee from the north arrived just as Harman's charge drove the Federals back into the woods. Hampton formed on the right of Jones, Lee on the left.

Buford moved Ames' infantry up into the woods, deploying his cavalry to the right and left of it facing Hampton and Lee. Dismounted troopers from Jones' brigade engaged the Federal infantry in a series of charges and countercharges that swept back and forth over the open ground between the church and the woods.

Neither side could gain an advantage and the line was stabilized.

Gregg's attack at Kelly's Ford was late, jumping off an hour after Buford. The Confederate pickets were driven in, carrying the warning in time for Robertson to form his brigade and dispatch couriers to Stuart informing him of Gregg's attack.

Stuart, from Fleetwood, ordered Robertson to protect the Confederate right flank while Buford was being engaged at the church. Robertson, in accordance with these orders, deployed his brigade across the road leading from Kelly's Ford to Brandy.

Gregg, finding the Brandy Road blocked, placed Russell's infantry, with artillery support, in position on Robertson's front. Gregg then moved his column to the right of Robertson on a wide, end around sweep toward Stevensburg.

Robertson observed the movement and advised Stuart of it, without, however, making any attempt to follow it and to keep it under surveillance. He had decided to hold his force intact lest the Federal infantry advance on the railroad to his rear.

Stuart sent his reserve regiment, the Second South Carolina under Colonel Butler, to Stevensburg as soon as he received Robertson's warning.

Meantime, Gregg pushed five miles southwest to the crossroads at Willis Madden's where he found an unguarded back road leading to Brandy. A detchment under Colonel Duffié was ordered to proceed to Stevensburg, on the road to Culpeper. Gregg, with the brigades of Wyndham and Kilpatrick, set out for Brandy, eight miles to the northwest across Mountain Run.

All action now centered on Fleetwood Heights.

Fleetwood itself was occupied by Major Henry B. McClellan, Stuart's adjutant, and a group of couriers who served as a message center. Stuart had left the heights to observe the action at St. James as soon as the wagons were dispatched to safety at Culpeper.

Some of "Grumble" Jones' videttes, still on the extreme right, were the first to report Gregg's approach. Stuart did not heed their warning, transmitted through Jones, seemingly because he mistrusted Jones' judgment.

Consequently, McClellan, on Fleetwood, was astounded a few minutes later, to find a strong Federal column approaching the heights at a full gallop. Surely a message from Robertson would have preceded such an appearance!

Fortunately for the Confederates, a howitzer under the command of Lieutenant Carter, was on the road crossing the southern slope of Fleetwood on the way to replenish its ammunition supply. McClellan ordered the howitzer to the crest of Fleetwood.

Carter swung into position and opened a slow fire against the head of the Federal column with what little ammuntion he had left.

Wyndham, in the Federal advance, assumed that the heights would be strongly defended. He reined in, deployed his troopers and brought a battery of three guns under Captain Martin into action on the slope.

Stuart, convinced by the firing behind him that the Federals were on his flank and in his rear, ordered Jones to send two regiments to Fleetwood.

Jones pulled the Twelfth Virginia, under Colonel Harman, out of the line, supported it with the Thirty-Fifth Battalion, Colonel White commanding, and dispatched them to Fleetwood.

It was now mid-morning. The drama that was to make Brandy Station a classic of cavalry engagements was unfolding in the columns of gray and blue that raced toward Fleetwood Heights.

Wyndham, leading the First New Jersey, charged up the hill just as Carter exhausted his ammunition.

Harman and his Confederates reached the crest of Fleetwood a scant 50 yards ahead of Wyndham and charged without forming a line. Wyndham and his Jerseymen broke the charge and shunted the Twelfth Virginia off to their right.

Hampton saw Wyndham's long blue line sweeping toward the crest. Hampton was already leading two regiments toward the Heights when Stuart came up to order reinforcements.

Gathering the scattered Confederate squadrons already on the scene, Hampton charged and drove Wyndham from the Heights, back across the railroad.

What remained of the Sixth Virginia had been sent to join Hampton and now rode down on Martin's exposed battery. The Union gunners stood fast and opened up with canister, point blank.

True to its record at the ford, the Sixth never faltered, but took its losses and rode over the guns, killing or wounding 30 of the 36 gunners as they fought by their pieces.

Buford, hearing Gregg's guns, attacked "Rooney" Lee in front, but the attack lacked determination. Lee withdrew slowly and in good order, fighting alone when Stuart dispatched the rest of Jones' and Hampton's brigades to join the fight at Fleetwood.

Kilpatrick came up just as Wyndham was thrown back across the railroad. Stationing a battery in support near the tracks, Kilpatrick joined Wyndham in a countercharge that swept the Confederates back up the slope and regained Martin's guns. There was no one to fight or move the guns, however, and they remained unserved.

Hampton, driven off by the combined forces of Wyndham and Kilpatrick, re-formed in the direction of St. James Church and charged back along the length of Fleetwood, his right riding along the ridge.

Veteran cavalrymen on both sides stood in awe as the opposing lines thundered toward each other and then met in one terrible impact. Colonel Blackford, Stuart's staff engineer, described "acres and acres of horsemen, sparkling with sabers, and dotted with brilliant bits of color where their flags danced above them, hurled against each other at full speed and meeting with a shock that made the earth tremble."

Dust and smoke covered the embattled regiments in a melee where pistols and carbines were useless. The saber decided the battle.

Pierce Young, leading Cobb's Legion on the ridge, drove the Federals before him and to the west.

Colonel Lomax' Eleventh Virginia overran the three Federal guns once more. The two still in condition to fire, Lomax turned on the retreating blue lines.

Gregg fell back toward Brandy in disorder. Misdirected fire from Confederate guns brought up to Fleetwood prevented Hampton from turning the Union withdrawal into a rout.

Part of the First New Jersey had been cut off by Young's attack on the ridge. The Confederate guns, under Captain Hart, blocked the only direct avenue of escape and the Jerseymen charged them.

Hart's gunners were no less stalwart, if more fortunate, than Martin's Federals had been a short time before. Fighting with pistols and sponge staffs, they beat back the Jerseymen, forcing them into a roundabout retreat toward Brandy.

Gregg was beaten, his column disorganized. Driven off the heights for good, he shifted to the north and formed on Buford's left.

This movement changed the character of the line as it had been established at St. James Church. During Hampton's attacks it had run east and west with "Rooney" Lee holding Buford in the northeast near the church. Now the line ran northwest to southeast, the Confederates massed along the ridge and past the church, the Federals in the woods to the north and east.

Fitz Lee's brigade under Munford arrived belatedly from its bivouac across the Hazel and formed on the left of "Rooney" Lee. Jones held the center, supporting the guns on the ridge. Hampton held the southern tip of the slope, angling toward the river. Beverly Robertson changed front to form the extreme right.

Robertson had not yet been engaged and was to end the fight without a casualty.

Pleasanton had been with Buford all day. When Gregg joined, Pleasanton assumed command of the combined force.

Fighting now passed to the artillery, and to dismounted troopers and infantry skirmishing in the woods near the church and in the open between Fleetwood and the river.

"Rooney" Lee's brigade, on the left, fought the last major action of the engagement late in the afternoon. The fight lasted for some time, the opposing lines surging back and forth as first one and then the other gained the advantage with pistol and the brute force of charging horses.

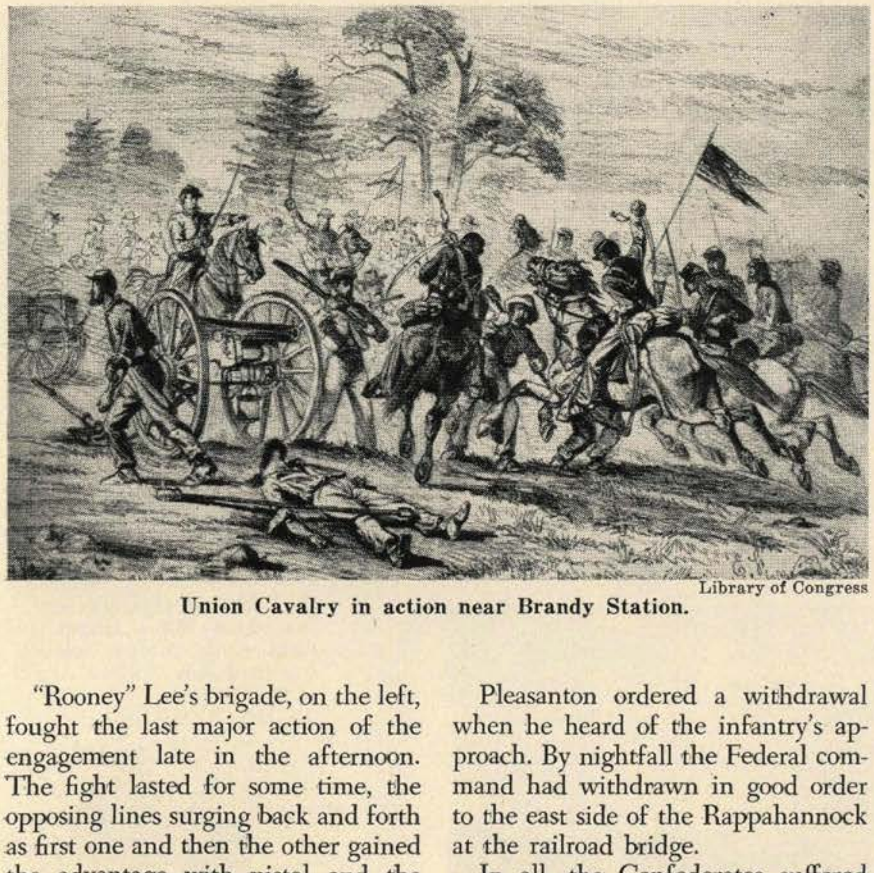
It was in this fight that "Rooney" Lee suffered the wound that was to lead eventually to his capture.

Far to the south, from Stevensburg to Mountain Run and along the Brandy road, a hot fight had been in progress all afternoon between Colonel Butler's Second South Carolina, reinforced by the Fourth Virginia, and the Federal detachment under Colonel Duffié, diverted from its destination at Culpeper by Butler's appearance.

Duffié was on the point of scattering his badly hurt opponents when ordered to rejoin Gregg by the roundabout route over which he had come. He reached Gregg too late to be of any assistance in the fight on Fleetwood slope.

Had Duffié been kept where he was he most certainly would have broken through into the Confederate rear just when Gregg needed him most.

It was nearly sundown. Stuart called for infantry support as soon as he ascertained the presence of Federal foot soldiers in Gregg's command. Ewell sent Rodes' division from Culpeper.


Library of Congress

Union Cavalry in action near Brandy Station.

Pleasanton ordered a withdrawal when he heard of the infantry's approach. By nightfall the Federal command had withdrawn in good order to the east side of the Rappahannock at the railroad bridge.

In all, the Confederates suffered 523 casualties and the loss of one flag. Pleasanton lost 936 men of whom 486 were prisoners of war. Three of his guns and six of his flags remained in Confederate hands.

Except for the flag, Pleasanton's only prize was Major Beckham's field desk which bounced out of a wagon during the major's hasty departure from the artillery park. There is no mention, in Pleasanton's report to Hooker, of any important intelligence being gained from this source.

No Union trooper had advanced far enough west to discover the encampments of Ewell and Longstreet. Thanks to this, Ewell was able to advance all the way to Milroy, in the Valley, before the Federals could locate him, and then it was too late.

Pleasanton, in his report, claimed to have broken up Stuart's plans for a raid. No such objective was accomplished for the simple reason that no raid across the river was planned. The Federal attack of June 9th did, however, stall Stuart's screening operation for several days.

From beginning to end, the Battle of Brandy Station was characterized by rapid and effective judgment on the part of the subordinate commanders.

"Grumble" Jones' quickness and his firm resolve to fight at Beverly Ford with everything available saved the Confederate horse artillery.

General Gregg's quick appraisal of the situation at Kelly's Ford enabled him to make the most of a bad situation, a situation caused by the Federal failure to scout the Confederate bank of the river and to determine the true position of Stuart's command at Brandy.

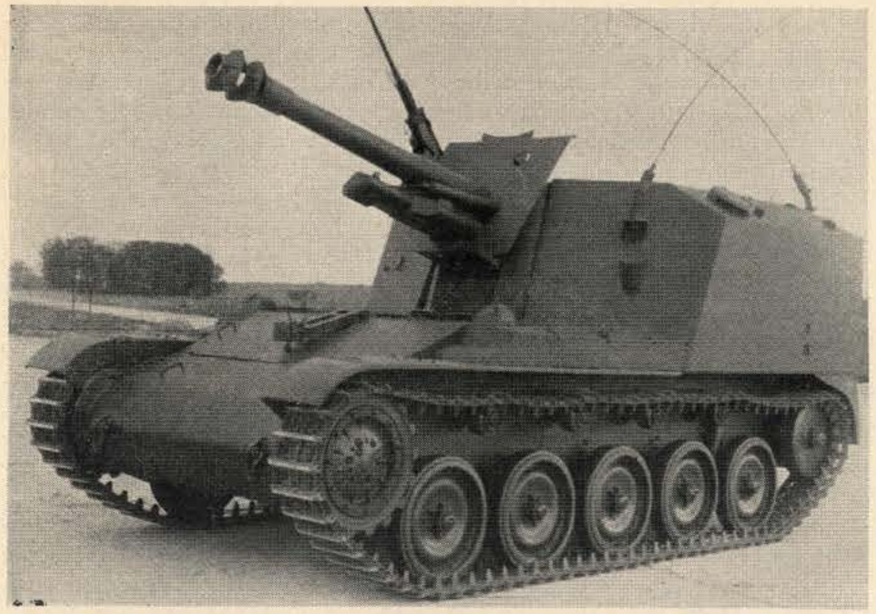
But of all the individual actions, none stands out so markedly as that of Major McClellan at Fleetwood Heights. Faced with a perilous and unexpected situation on the approach of Wyndham's column, McClellan seized upon Lieutenant Carter's gun to win, with bluff and fire, the minutes that saved Stuart from disaster.

Of the thousands on both sides whose individual deeds passed unnoticed or have been forgotten, suffice to say that no unit wavered in the performance of its duties. The men of both the blue and the gray fought with a *dash* and *elan* that kept Brandy Station uppermost in the minds of the survivors to the very end of their lives.

From the end of the Gettysburg campaign until the last, sad day in April, 1865, the cavalry of the Confederacy was never again the superior of the blue columns that rode against it. Nor was there, from 1863 on, anything to choose between the opposing arms in spirit or the will to fight. They left behind a record that can be read with profit by every soldier who follows in their traditions.

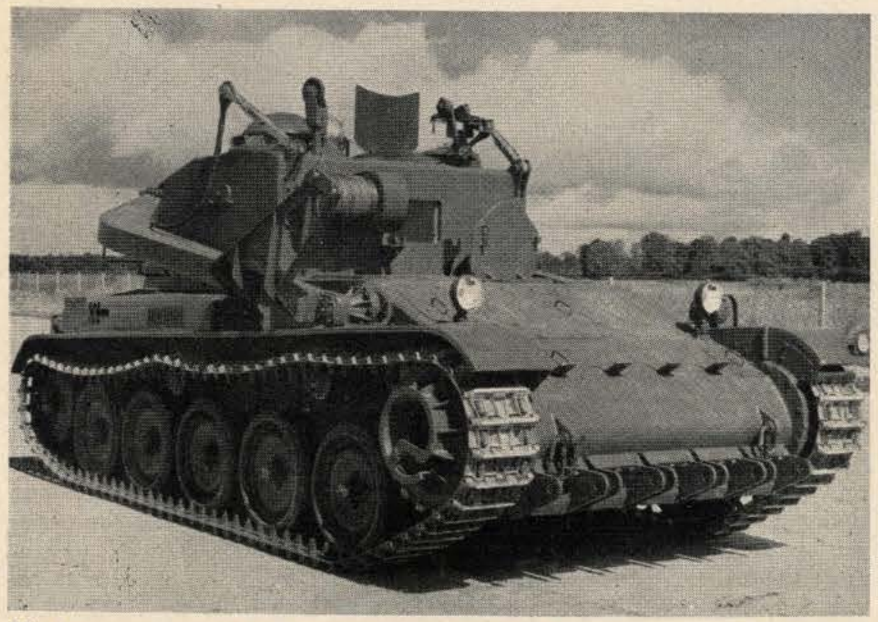
FRENCH ARMOR

All Photographs Official French Army

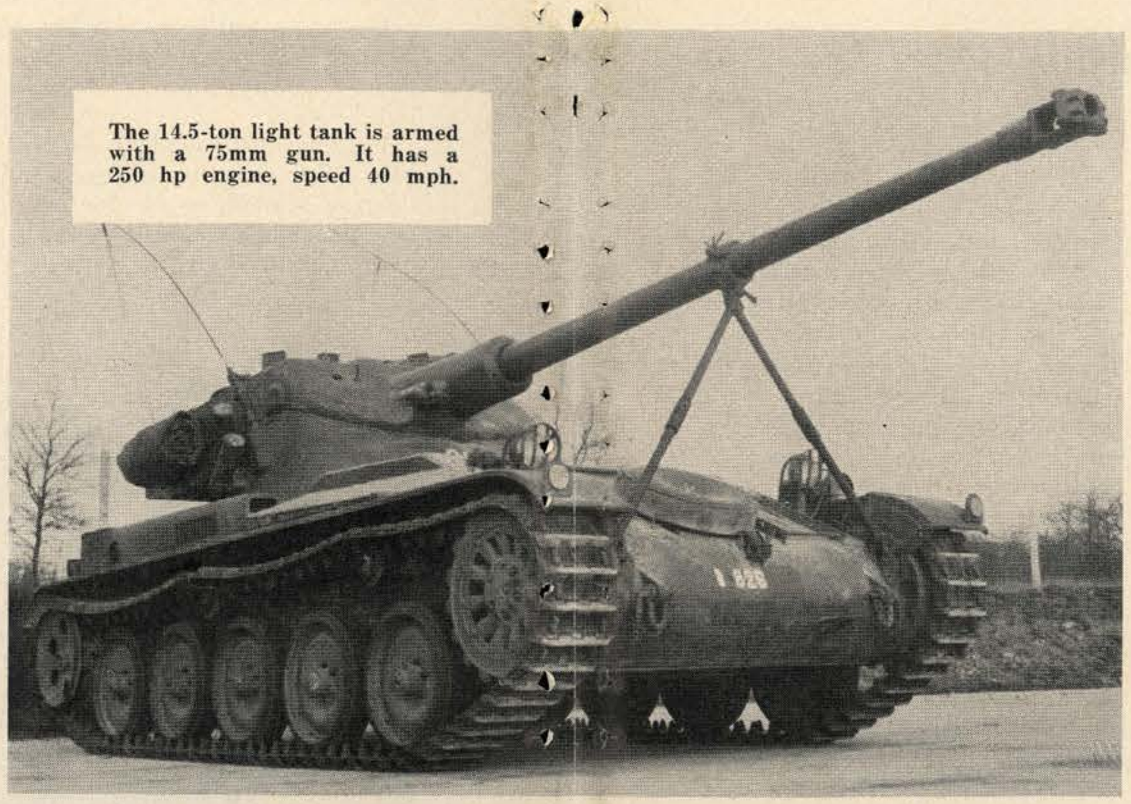


The 105 SP howitzer has the mechanical characteristics of the light tank.

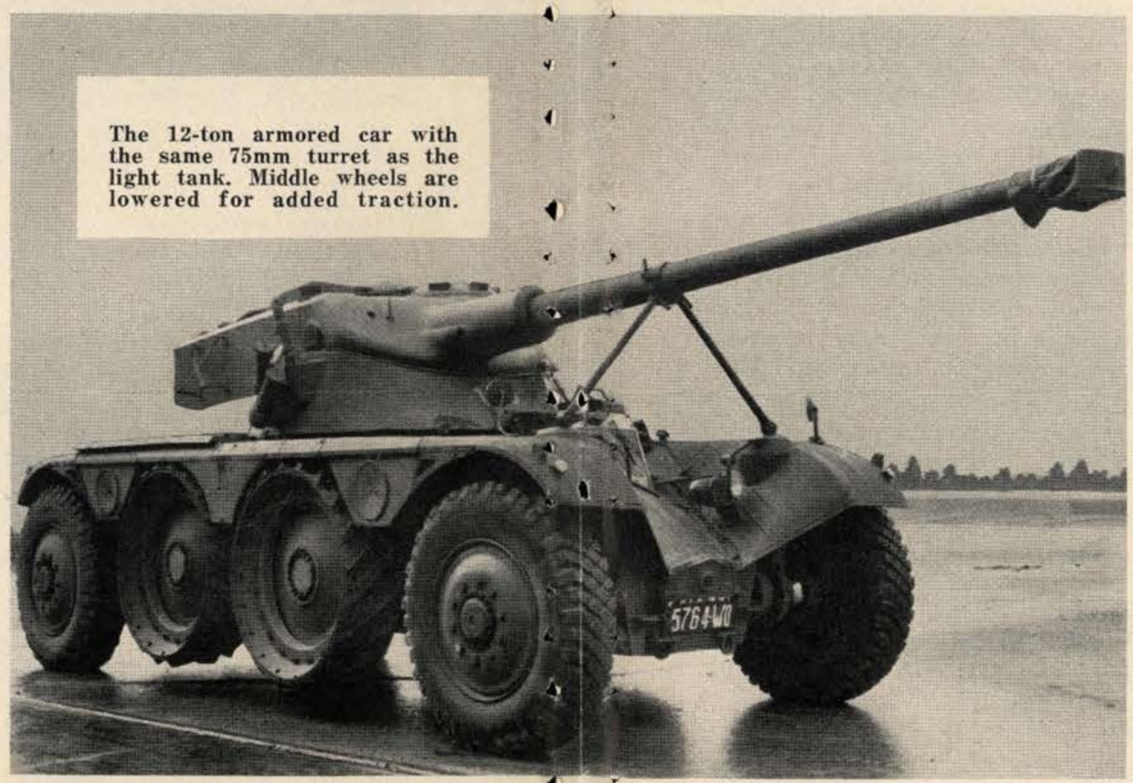
Several years ago, ARMOR presented a pictorial feature of the latest Armored vehicles developed by the French. It appeared in the July-August 1951 issue. At that time most of the vehicles were in the prototype stage of their development. Since then the French government has made some modifications and produced an entire family of Armored vehicles. Most of them in production are in the hands of the using combat arms. The only exception, shown on these pages, is the Armored Personnel Carrier in the lower right hand picture. This vehicle is now in the prototype stage. In addition to the 12-man squad, there is a driver. It carries a 7.5mm machine gun and its approximate height is six feet, eight inches. The 75mm gun on the light tank has a muzzle velocity of 3300 feet per second. Its 250 horsepower Pancake engine has eight cylinders. The Armored recovery vehicle carries a 3-man squad. All pictures shown are official French Army photographs and were obtained through the courtesy of the French Military Mission, from its technical representative stationed in Washington, D. C. In the next several issues, ARMOR will endeavor to obtain pictures of families of Armored vehicles from other nations for benefit of its readers.



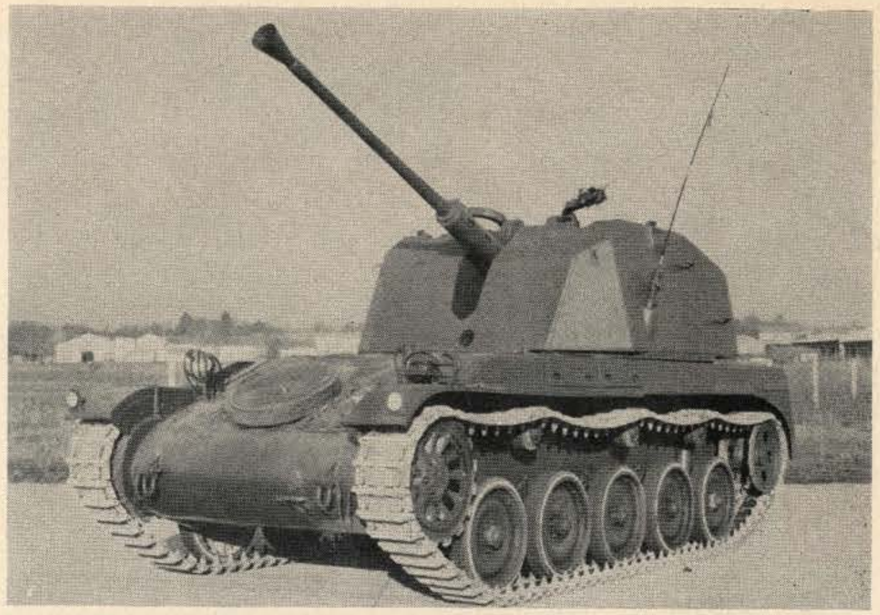
The recovery vehicle is protected against small arms and shell fragments.



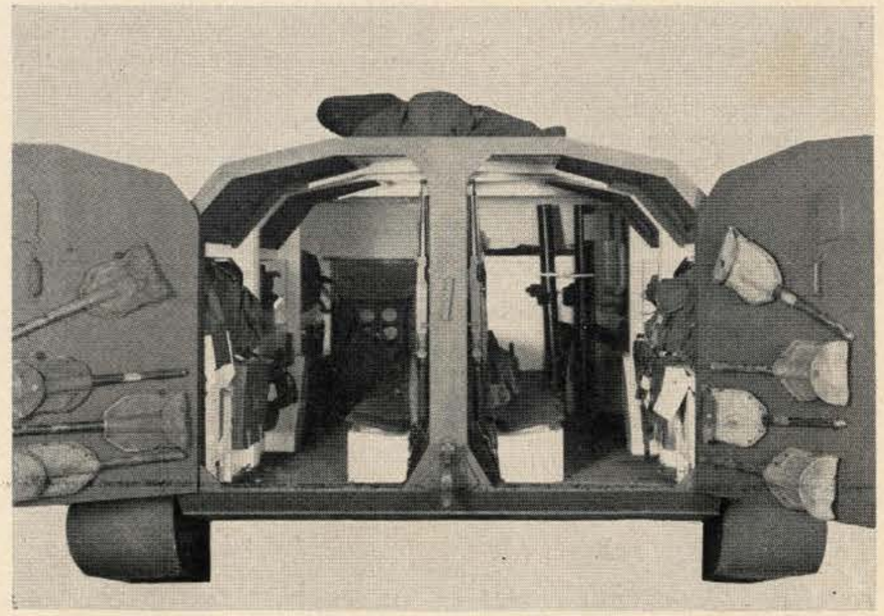
The 14.5-ton light tank is armed with a 75mm gun. It has a 250 hp engine, speed 40 mph.



The 12-ton armored car with the same 75mm turret as the light tank. Middle wheels are lowered for added traction.



SP gun from the same family as the 105 howitzer with 40mm AA Bofors.



Pilot model of the personnel carrier capable of carrying a 12 man squad.

THE CLASSROOM IN THE FIELD

By LIEUTENANT COLONEL JOSEPH R. CROCKER

"THE next step in the operation of Radio Set AN-GRC-3 is to turn OFF-INT-RT-70 switch on the interphone amplifier to RT-70 position. . . ." The communication instructor pauses, while his assistants move about the long row of tables and supervise student performance.

Each student, as he studies the radio set mounted on the bench before him, might ask himself: "Why is correct procedure so important? Why must I be able to operate this radio? I am an officer. How does it fit into the over-all picture? How will I use it when I am commanding a tank unit in the field?"

In another classroom the instructor is standing before a large sketch of a terrain area. "Your tank platoon is advancing along this road. Suddenly, when your leading tank draws abreast of this house, it comes under heavy fire from concealed automatic weapons located along the hedgerow indicated on this sketch." The instructor indicates the location with a long red-tipped pointer and looks about the classroom as the students study the problem. "What would be your actions?" A few students signal for recognition, others wrinkle their brows and look perplexed, and some squirm lower in their seats.

To some students at service schools such scenes occupy too many of their instructional hours. Perhaps there is a valid reason for the vague feeling of frustration and inadequacy that students experience while attempting to work map problems or solve classroom requirements. Handling a tank unit in a comfortable classroom far removed from the complicated and fantastic mixture of woods and plains, mud and dust, rain and sun, noise and confusion, men and their individual ways, machines and their limitations, does erase the complexities and realities of actual situations. If the student has served with troops, he is painfully aware that most operations do not proceed with clocklike regularity. He knows that the actions of man (friendly or enemy), matériel, weather and terrain cannot be reduced to a mathematical formula on paper or fully comprehended in generalized principles and precepts.

Such considerations may obscure the positive values of formal instruction. The units of instruction presented in the form of classroom conferences or shop work are frequently labelled as academic, theoretical or abstract, but such training does effect maximum utilization of time; does provide opportunity for the presentation of definite principles; and does enable the student to acquire certain basic skills. As a matter of fact, even in the classroom, workshop or demonstration area, a considerable portion of the instruction is presented as individual and group performance. In some types of problem-solving requirements associated with tactics or staff procedure, the various phases or mental processes are analogous to those activities that transpire in the field. In the "hardware" departments, such as Weapons, Automotive and Communication, the bulk of instruction utilizes tangible objects; the students operate and maintain radios and vehicles; they not only study the nomenclature and use of weapons but they also fire these weapons.

It is readily conceded, however, that such techniques represent only one portion of military instruction. The application stage, as an essential step in the learning process, must be constantly exploited. It is acknowledged that formal instruction must be followed by exercises which necessitate the active application of technical skills and tactical knowledge as a finely integrated instrument. Tactics and techniques, men and machines, cannot be divided into separate volumes; walls cannot be permitted to develop between knowledge and application.

Fully appreciative of these recognized advantages, The Armored School constantly endeavors to introduce practical exercises during the appropriate phases of the various nontechnical courses. At the present time,

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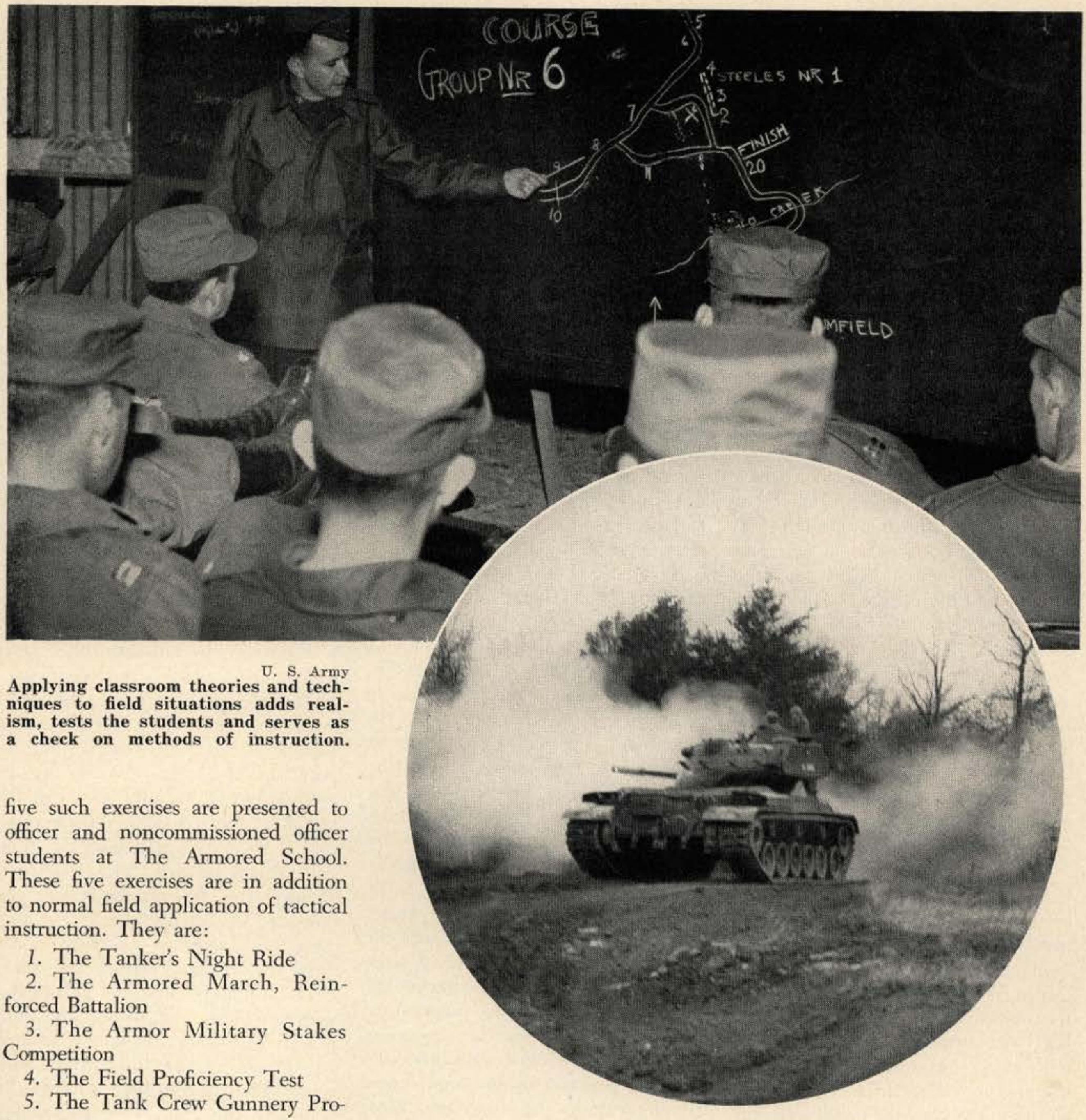
To some of our readers the five practical problems described in this article might appear as repetitious material. However, in teaching tactics to Armored units they are invaluable.



U. S. Army

Applying classroom theories and techniques to field situations adds realism, tests the students and serves as a check on methods of instruction.

five such exercises are presented to officer and noncommissioned officer students at The Armored School. These five exercises are in addition to normal field application of tactical instruction. They are:

1. The Tanker's Night Ride
2. The Armored March, Reinforced Battalion
3. The Armor Military Stakes Competition
4. The Field Proficiency Test
5. The Tank Crew Gunnery Proficiency Course

In the preparation and presentation of these exercises, the typical problems which are inherent in any type of applicatory instruction are evaluated and adjusted through interdepartmental coordination and cooperation. The situations and requirements must emphasize basic doctrines, techniques and skills; yet they cannot be shopworn, trite, repetitious, ambiguous or extremely unique. They must appeal to the student, arouse his motivation, fire his curiosity and demand use not only of brains but also of hands. An objective, reliable and comprehensive examination or testing system must accompany these requirements. Consideration must be granted the demands imposed on the faculty, for such exercises require extensive planning, rehearsals and close coordination and control. Certain limitations relative to availability of supporting troops, service personnel, material and training areas frequently impose restrictions on the scope and duration of the exercises. Budgetary ceilings and cost factors also affect the program. Other requirements cannot be ignored: Consideration must be granted other types of instruction; subjects and objectives listed in the programs of instruction cannot be summarily dismissed nor relegated to the background.

In describing the five exercises, the detailed explanations of the situations and requirements have not been included, because such a revelation would compromise the validity of the tests. These brief sketches serve only to indicate the nature and scope of the exercises, the values and contributions, the organization and techniques of presentation, and the nature of the student reaction.

Time: 2300 hours.

Place: Somewhere on the Fort Knox Military Reservation.

Characters: Three young second lieutenants, Armor Officer Basic Course.

First Officer: (Fumbling with a map in the darkness.) "Where in the — are we?"

Second Officer: (Pointing down a trail.) "Maybe if we went *thataway* . . . ,"

(The third officer merely yawns and slides down in the seat of the jeep in a vain attempt to escape the cold wind. The School driver, seated with his head resting on the wheel, remains silent. He has been cautioned not to offer any help or make any suggestions. As a veteran of several night rides, he has heard that same plaintive cry before.)

A month later, however, these same students have forgotten that incident and remember the Tanker's Night Ride as one of their more stimulating instructional units received at The School. That eight-hour exercise is more than a simple field test, an examination of information acquired in the classroom.

This practical exercise, as presented by the Command and Staff Department, represents the logical evolution of the night rides that were used at some of the service schools during World War II. Now, as then, the objectives are to emphasize mobility to stimulate appreciation of terrain; to increase confidence and training in ability to traverse varied terrain under blackout conditions; and finally, to test the ability of students in the application of knowledge. In seeking to achieve these aims, the exercise is presented as a competitive field test in which three-man officer teams are required to plot on a map the location of nine check points, plan the route to each point in a designated sequence, then actually travel the 32 miles of roads and trails in a quarter-ton vehicle under strict blackout conditions. Such requirements necessitate an analysis of roads and terrain by map and personal reconnaissance. In addition to this group of requirements, each student is called upon to solve a series of problems which are presented at the various check points. These are practical and realistic demands, involving a working knowledge of small unit tactics, communications, use of tank weapons, care and inspection of vehicles, map reading and the duties of a liaison officer. As a concurrent examination, the students are graded on their solutions to the individual requirements, the locations of the check points and the time required to cover the complete course. These obstacles may not appear to be formidable, but the station requirements are not simple true-false questions, the check points are not located at obvious crossroads (many are off the roads) and the route is not a straight line from A to B.

The field test is presented after the student officers have completed the portions of the course presented by the Communication, Automotive, Weapons and General Subjects Departments. Toward the conclusion of the Armor Basic Officer Course, the Command and Staff Department releases a warning order—advance information which indicates the general nature of the event, the uniform and equipment necessary and the organization of the three-man teams. On the prescribed date, the faculty representative assembles the teams for a brief orientation; he issues the necessary maps and individual score cards, suggests the importance the course assumes in the program of instruction, indicates the procedure to follow and offers certain advice as to safety precautions and regulations. Before leaving the classroom, however, the student teams study the printed instructions, plot the location of the nine check points, plan the route and estimate the mileage and gasoline requirements.

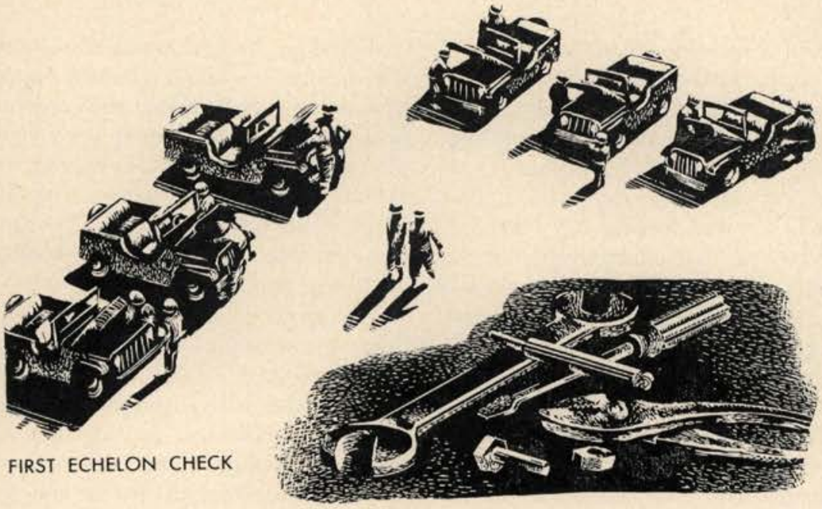
They proceed to the motor park, inspect their vehicles, perform the necessary before-operation maintenance and depart. Incidentally, the driver, who is assigned to the vehicle by School Troops, confines his activities to the driving; he is not permitted to offer suggestions or correct mistakes unless demanded by safety regulations. Upon reaching the designated light line, the teams are checked by a military police detail and cautioned to proceed under strict blackout. This requirement is enforced by patrols located on all roads; they also ensure that speed limits are not violated and that dangerous curves, embankments, ravines and dead-end roads are avoided.

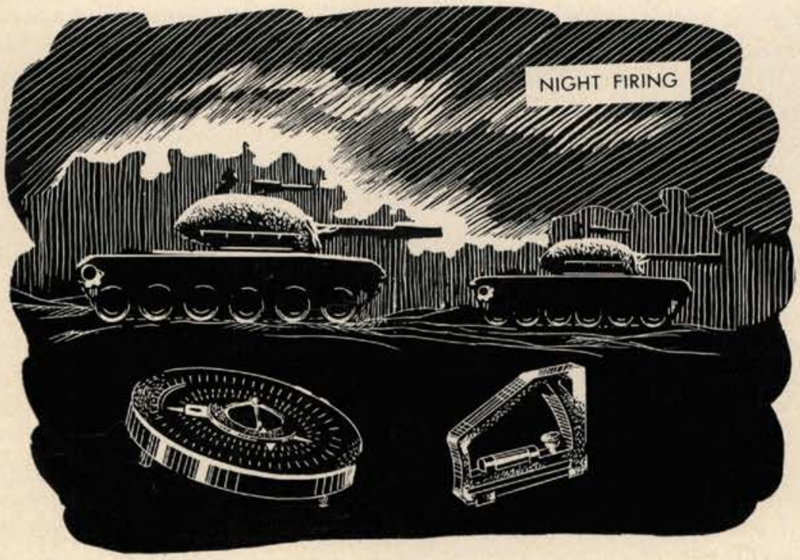
On arriving at the check points, each student is confronted with certain problems; the simple but fundamental questions are based on the training he has received in the classrooms. His solutions are scored by the instructors on duty at each station. In order to prevent the test from being compromised, the sequence in which each team proceeds to the various check points differs from the others. In addition the locations of the check points are changed every time the exercise is presented. Furthermore, the requirements themselves are periodically revised and changed.

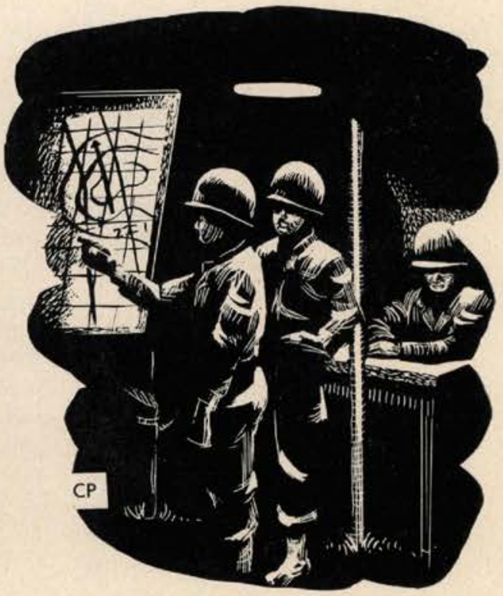
After all check points have been located and various requirements completed, the teams return to the motor park and perform after-operation maintenance. Then each team reports to the classroom, where its course-time is officially recorded; the members then surrender their maps and score cards. Following an interval which permits rest, food and showers, the class reassembles for the critique. During this break the umpires and assistant instructors prepare the critique, check the score cards and determine the team winners to include first, second and third places. The scores are then examined to determine the individual high score. The officers who successfully complete the course are awarded a certificate upon graduation.

Over five classes have participated in this exercise and 87 teams out of a total of 155 have successfully completed the course with only two accidents. To date, the fastest time has been seven hours and 45 minutes. All officers who have been on the Tanker's Night Ride have revealed sincere interest and a high degree of enthusiasm. They generally retain most of the lessons they learned on the ride—mainly because of the method of presentation and the atmosphere of suspense, anticipation and excitement that dominates the event.

TANKER'S NIGHT RIDE


FIRST ECHELON CHECK


NIGHT FIRING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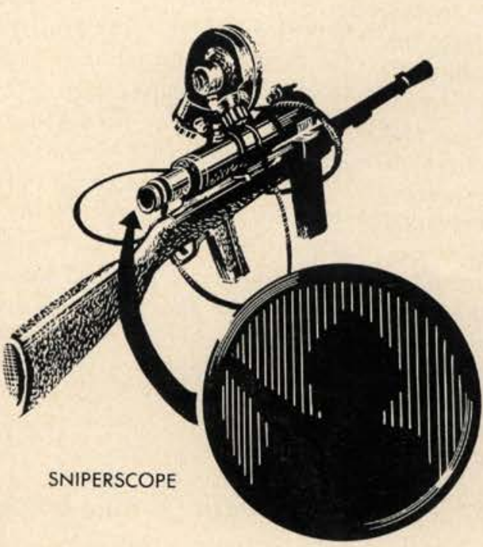
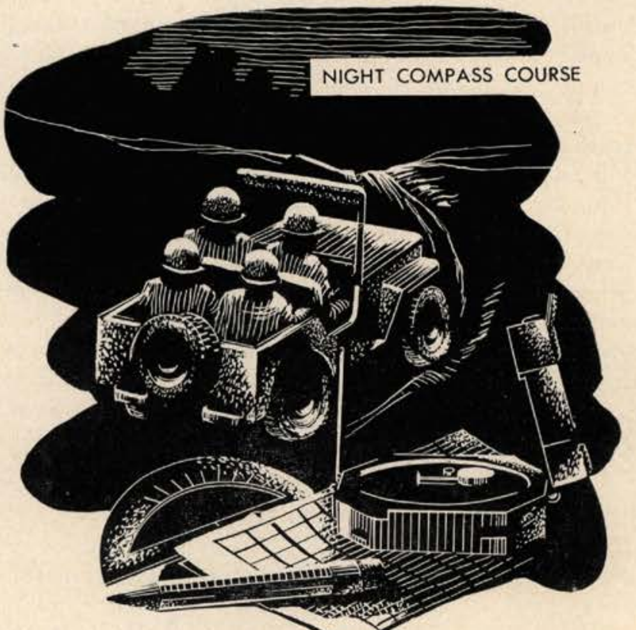

SNIPERSCOPE


NIGHT COMPASS COURSE

When one watches a tank unit deploy on the open plains below, notes the mechanical precision of the movements of each subordinate element and comprehends the overwhelming firepower that these tanks are capable of throwing against the enemy, he will, if he is a tank officer, appreciate the problems involved in maintenance and communications, in exact coordination and timing, that enable the unit to function as an integrated fighting machine.

Many officers, attending advanced courses at The Armored School, are from other branches and services and have not had the opportunity to witness such sights or to participate in the everyday activities of a TOE armored unit. Also it must be admitted that some Armor officers have not served with armored units for many years. Thus, when the classroom instructor discusses routine operations of a tank unit in the field, these students can neither truly visualize the power and might of the tank battalion, nor fully appreciate the complex problems of maintenance and communications involved in the most simple operations. These are some of the reasons why The Armored School presents a 24-hour unit of instruction on the subject, "Armored March, Reinforced Battalion," to all Armor Officer Advanced and Associate Armor Officer Advanced Classes. This unit is a practical exercise in the conduct of a reinforced tank battalion march under tactical conditions; it also includes a demonstration of a reinforced tank battalion moving into a bivouac area from march column. Prior to the presentation of this exercise, the students are assigned the command positions in the unit. The School designates the student battalion commander; he in turn selects his own staff and company commanders. If the class is large, students may also serve as individual tank commanders. An alternate tank battalion commander and an additional S3 are included to permit greater student participation. School Troops furnishes all standard TOE equipment and matériel. A minimum of two tank crewmen per tank is also provided. The School, in conducting this exercise, utilizes one chief instructor from the Command and Staff Department and one tactics instructor for each letter company, including the armored infantry company. Assistant instructors are also present from the Automotive and Communication Departments.

In the conduct of this exercise, realism is constantly emphasized. All the problems normally encountered in moving a tank unit from a bivouac to an assembly area and to an attack position must be solved by the students. These include such activities as staff planning, issuance of orders, formation of combat teams, resupply and feeding under tactical conditions. With the exception of administrative messing and the critique, the student officers actually do the jobs that they would be called upon to perform in combat. Control by the instructors is exercised only when absolutely necessary. The student battalion commander is responsible for all that the battalion does or fails to do.

The execution of this exercise is divided into five phases. As the introductory stage, the students witness a demonstration in which a 90mm gun tank battalion, minus one tank company and reinforced by one armored infantry company, demonstrates the principles and techniques of marching, the actions of the quartering party at the release point and the occupation of a bivouac area.

In the second phase the students are moved from their observation point to the bivouac area and assume their respective roles as commanders and staff officers of the battalion. The requirements at this time include the planning, preparation and execution of a daylight tactical march to include the occupation of an assembly area. The major problems that the students must solve are concerned with staff planning, issuance of orders, organization of quartering parties and security elements, vehicular and weapons maintenance and communication operation and procedure.

The third phase covers the planning, preparation and execution of a tactical march from the assembly area to the attack position under blackout conditions. In addition to these requirements, the student battalion commander plans for the attack and issues his attack order in which he designates his organization for combat and indicates the missions of the subordinate elements of his command. The subordinate commanders, in turn, issue their own orders.

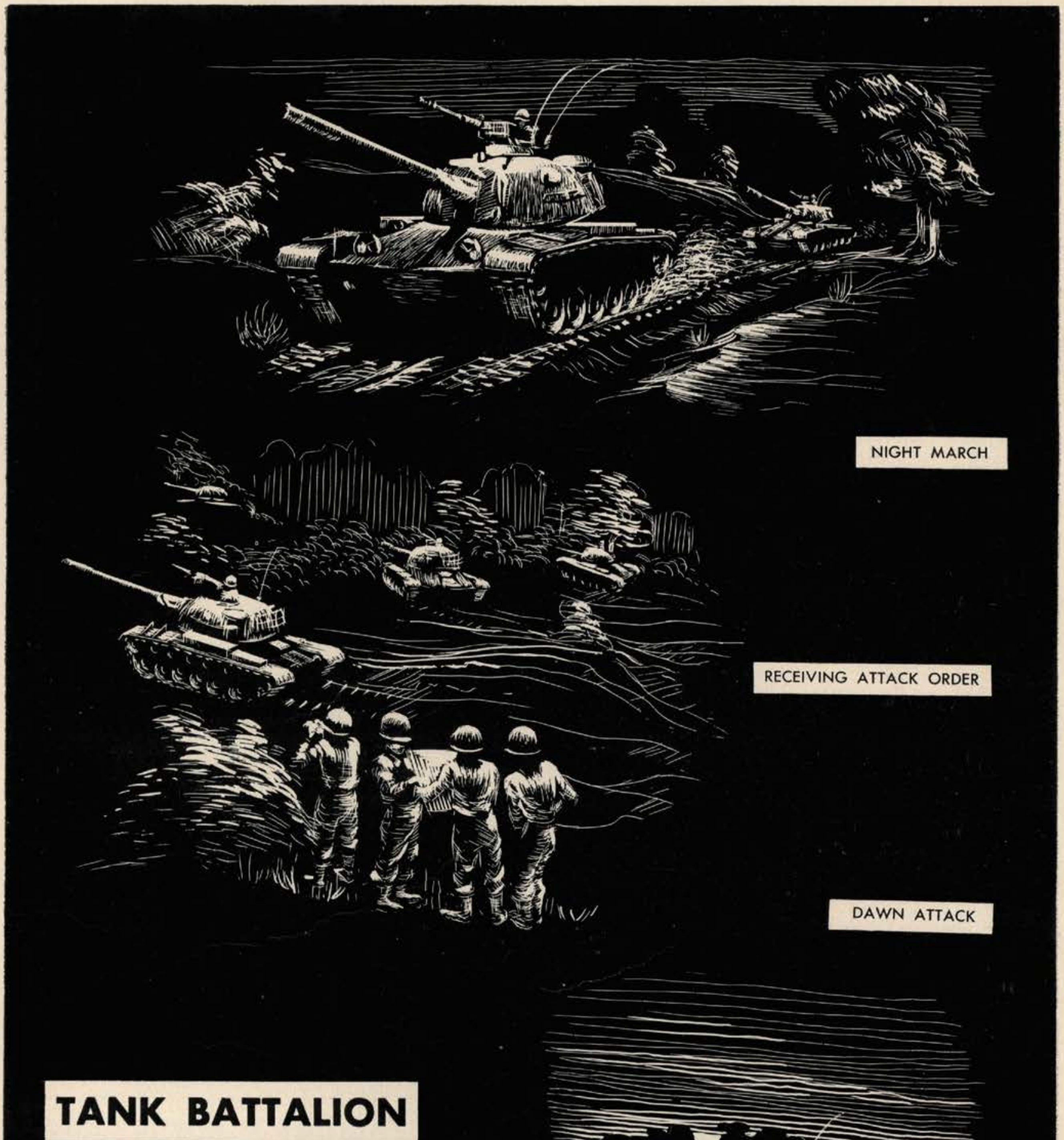
When these requirements are solved, phase four—the critique—is presented by the instructors who have witnessed and who have checked all major activities associated with the conduct of phases two and three.

In the fifth and final phase of the exercise, the students move the battalion from the training area to the motor park, where after-operation maintenance is completed. This movement is a simple administrative march during daylight hours over paved roads, where normal traffic problems are encountered.

It is obvious that the successful execution of this exercise demands the practical application of integrated technical and tactical knowledge. But to a great extent its success is dependent upon the attitude of the students. If they adopt an enthusiastic attitude and accept their roles as responsible individuals, they not only receive valuable practical lessons but also acquire renewed confidence in Armor and a heightened enthusiasm for their profession.

Moving units on paper in the classroom teaches the student the basic fundamentals of mobile warfare. The Armored March, Reinforced Battalion, stresses the problems involved.

TANK BATTALION NIGHT MARCH


NIGHT MARCH
RECEIVING ATTACK ORDER
DAWN ATTACK

"The Olympic Decathlon could never be any rougher than this," gasped the young second lieutenant as he staggered across the finish line of the Armor Military Stakes course. Such a statement possesses a certain degree of validity. Substitute for the various athletic skills those qualities demanded of the well-trained junior field officer and a reasonable degree of similarity exists. Of course, the military test not only requires a high degree of physical stamina, but also demands the application of basic military knowledge and the actual employment of military weapons.

This individual field exercise has an historical background and represents the logical development of the "Standard Stakes" which was held for so many years at The Cavalry School. At that time, the "Standard Stakes" was primarily a mounted competition requiring a high degree of physical conditioning and a thorough knowledge of the handling and firing of weapons. As the exercise is currently presented, horses and vehicles are not used; the individuals traverse the course on foot. Presented as individual competition the course is a race against time, during which the contestants solve problems involving combat intelligence, communications, field engineering, map reading, automotive maintenance and operation, nomenclature and operation of weapons and small-unit tactics.

The course is offered to the officers of all Armor Officer Basic Classes. Some two weeks prior to graduation, the members of the class are assembled for the preliminary orientation. The class is informed that the course consists of 18 stations extending over a distance of 5 miles. The layout and location of each station are indicated on a large map. The contestants are further informed of any restrictions and off-limits areas, the administrative conditions and other miscellaneous details. The objective is quite simple: Each contestant is to move from station to station as quickly as possible, completing all requirements that are presented at each station and return to the line of departure. It is possible to receive 1000 points. Each station has a scoring value ranging from 25 to 105 points. Some stations award partial scores, but others require a completely correct solution to obtain a rating. The station scores total a possible 750 points and the time score is worth 250. This last figure is based on an optimum time of 110 minutes for the complete running of the course. Five points are subtracted from the maximum of 250 for each minute used over 110 minutes through 150 minutes. Although students frequently cover the course in 110 minutes, their final score is seldom more than 835 points because of the demanding requirements and the strict scoring at all stations.

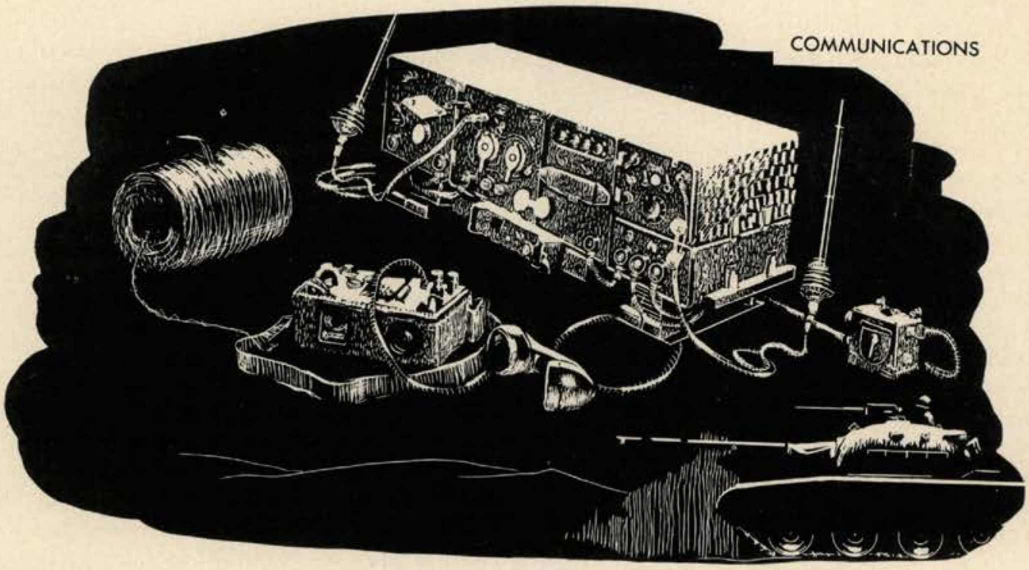
The similarity of this contest to an athletic event is further suggested by the atmosphere that pervades the group at the start of the course. Each student has a large identifying number pinned on his back and a score card in his hand. Heats of six students each begin 5 minutes apart in order to prevent crowding at the various test stations. The time lost while waiting at any station does not penalize the contestant. As a student arrives at a station he is suddenly confronted with a basic but important problem. For example, he might be called upon to operate a field telephone or radio or to determine his position with map and compass. He also encounters requirements based on vehicular maintenance. Several situations are concerned with basic combat intelligence. At some stations, he is required to disassemble, assemble, and fire a variety of weapons and to operate fire-control instruments. At other stations he might be called upon to find his way through a minefield or to demonstrate knowledge of demolitions. At still another station, he will encounter a problem which requires the application of tactical knowledge. Upon completing all stations, the student must return to the finish line.

This exercise possesses several distinct assets. In the first place, it dramatically illustrates the point that knowledge acquired in the classroom is worthy of respect; frequently the student discovers that abstract knowledge in itself is meaningless—the individual must possess the physical ability and mental attitude to apply his knowledge in the solution of apparently simple problems. Once he realizes that he is able to successfully accomplish this type of integrated activity, his confidence is strengthened. There is no doubt as to the motivation aspect of this unit of instruction. And finally the course provides opportunity for an objective analysis of individual proficiency.

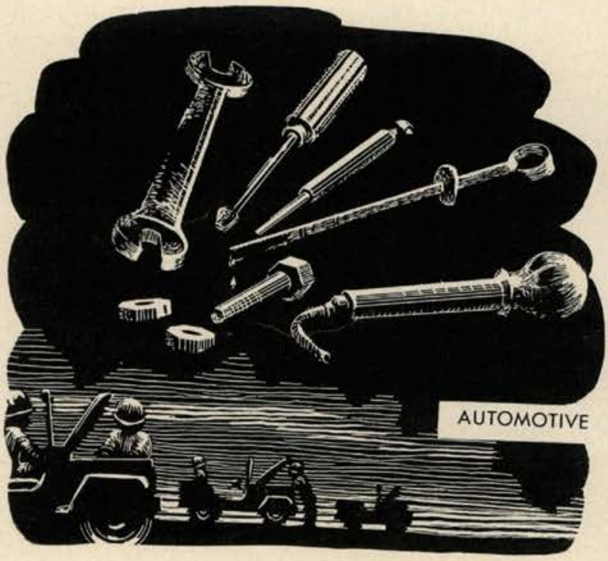
On the other hand, one cannot ignore the contention that this is an individual challenge in which the individual plays the star role; the military team is not present. It is also possible that sheer physical prowess, manual dexterity and technical skills dominate the exercise. For the small-unit leader, however, the ability to physically perform those tasks that he will demand of his men, contributes to self-confidence, analysis of unit capabilities and knowledge of subordinate jobs. In the absence of group participation there is limited opportunity for the displays of small-unit leadership or the solution of tactical problems under field conditions. It is also noted that the mechanics of the presentation require the expenditure of time, personnel and matériel. The General Subjects Department, which is now charged with the presentation of this exercise, is assisted by personnel from The Armored School. Representatives from the departments concerned (Automotive, Communication, Weapons, General Subjects, and Command and Staff) serve at the various stations as umpires and rating officers. Approximately 150 men, 1530 pieces of equipment (ranging from tanks to pencils) and 3330 rounds of ammunition are required to stake the "Armor Military Stakes Competition." But when one talks to those students who have completed the course and observes their morale, enthusiasm and high spirits, he readily agrees that the Armor Military Stakes is entitled to be identified as one of the most positive features of the Armor Officer Basic Course.

MILITARY

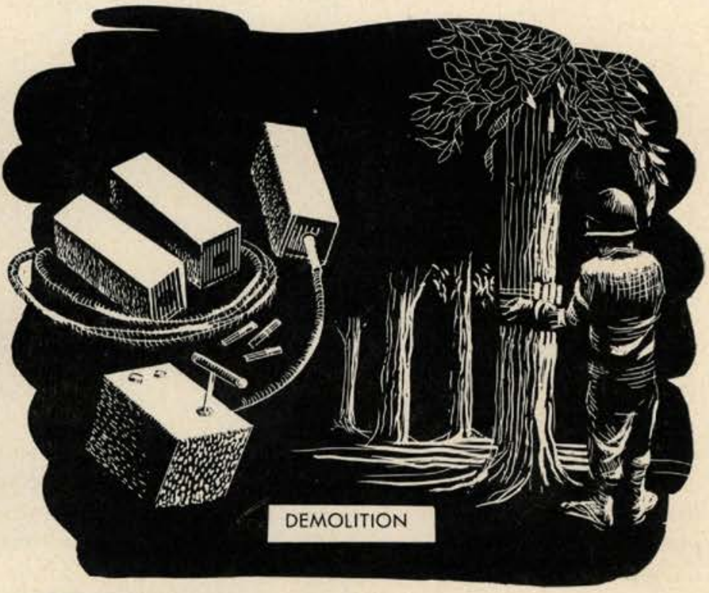
STAKES



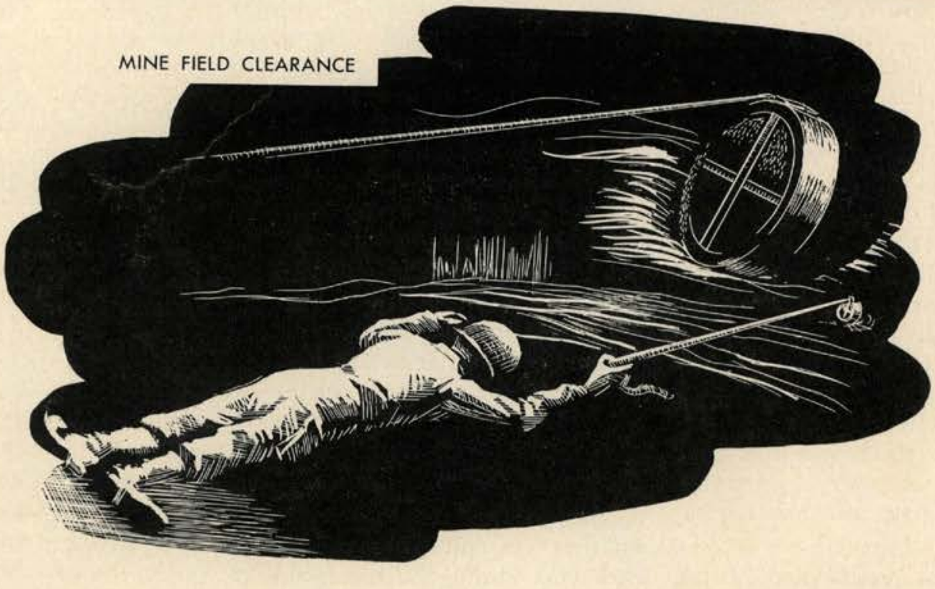
COMMUNICATIONS



AUTOMOTIVE



DEMOLITION



MINE FIELD CLEARANCE

The Armored School, conscious of the role of the noncommissioned officers in contributing to the efficiency of small tank units, is constantly striving to improve the courses of instruction presented to this group. In addition to the normal technical courses, the school offers an Armor Advanced Noncommissioned Officers Course, which is designed to train selected enlisted personnel as tank commanders, section leaders and platoon sergeants. This program of instruction includes, in addition to communications, maintenance and gunnery, a detailed series of subjects that are more concerned with men than with machines—map reading, leadership and small-unit tactics. Textbook familiarity with tactics and technical proficiency with matériel does not automatically ensure competent combat leaders. The noncommissioned officer must also be able to actually apply this set of skills and body of knowledge in the execution of his duties and responsibilities as a combat leader. In advancing this aim, The School has established the Field Proficiency Test—Armor Leadership Award for the purpose of promoting, developing, and testing combat leadership on a competitive basis.

Although this test is presented toward the end of the course in the form of a three-day practical field exercise, the basic or initial phase is established when the enlisted man first reports as a student. At that time he becomes an active participant. Throughout his stay as a student, he is closely observed by the permanent party personnel of the Student Regiment. He is constantly rated on discipline and morale, on leadership potentials and on general conduct. Toward the conclusion of the course, the evaluations of this observation are reduced to a numerical score and combined with the total grade attained in the academic departments. Those students who receive the highest combined ratings are selected as section leaders; the members of their tank sections are chosen from the students who have also received superior ratings.

Prior to the presentation of the exercise, the selected students are informed as to the purpose, scope, organization and general nature of the field test. Faculty representatives explain that the exercise is designed to demonstrate practical leadership qualities and to determine the most outstanding leader and tank crew of the sections participating in the exercise. Each team, consisting of one tank section, is required to solve a series of typical procedures, problems and situations. Such a demand involves the realistic application of previous instruction in communications, automotive maintenance and operation, tank gunnery, field engineering and expedients, map reading, leadership principles and small-unit tactics. When the students face and solve these actual problems, they acquire a renewed appreciation and comprehension of the responsibilities and duties that confront the tank leader in combat operations. During the conduct of the field exercise, the participants not only perfect their diverse skills and apply abstract knowledge as an integrated and unified instrument, but they also strengthen their confidence in themselves and equipment.

Early on the first morning of the test, the students report to the motor park, where they are issued completely equipped tanks. At that time they fulfill the requirements of several test stations. These are concerned with automotive maintenance, maintenance and adjustment of all fire-control equipment and weapons and maintenance and operation of communication equipment. Representatives from the technical departments are present to check and grade the performance of individuals and crews.

Each section is then required to move from the motor park to the next testing area; umpires, armed with check lists, score all phases of this tactical march, including maintenance, march procedure and orders. Upon arrival at the next test station, the sections are confronted with certain practical problems relative to tank gunnery and associated subjects. Every action, every command, every movement, is observed and rated.

The tank sections then move to another area; umpires accompany each tank during the tactical march and note all activity, especially that associated with tactical movements, maintenance and communication. The distance involved is sufficient to introduce the typical problems encountered in such a movement.

The next two stations complete the activities of the first day. During this phase, which extends into the night, realistic situations are presented—those that frequently confront tank crews and small-unit commanders in combat. All test stations presented during the first day of the exercise tend to emphasize the application of training received in the Communication, Automotive and Weapons Departments. Nevertheless, these problems are cast in a surrounding tactical situation and scores are compiled on tactical as well as communications, maintenance and gunnery points.

Early on the second day, the section umpires orally present the situation and the requirements. During the day the section leader encounters a logical series of situations; he not only directs the activities of a tank section, but sometimes he assumes the role of a platoon sergeant. Solving this group of progressively related requirements necessitates the utilization of the lessons that the student has received in the Command and Staff Department. The accompanying section umpire rates not only the section leader but also each tank crew. When the requirements of each station are completed, a brief critique is held before proceeding to the next test phase.

During the second day the exercise is primarily concerned with the natural development of the progressive series of events that a tank platoon frequently encounters in combat: a tactical march, bivouac, reconnaissance, attack, defense and renewal of the offense. Although field firing problems, utilizing live ammunition, have a place in the exercise, safety precautions prohibit the use of explosives in most of the problems that emphasize tactical operations. The use of an aggressor and controlled demolitions, however, tends to stimulate the illusion of reality. The accompanying umpires also add to this effect through their vivid and graphic presentation of the situation.

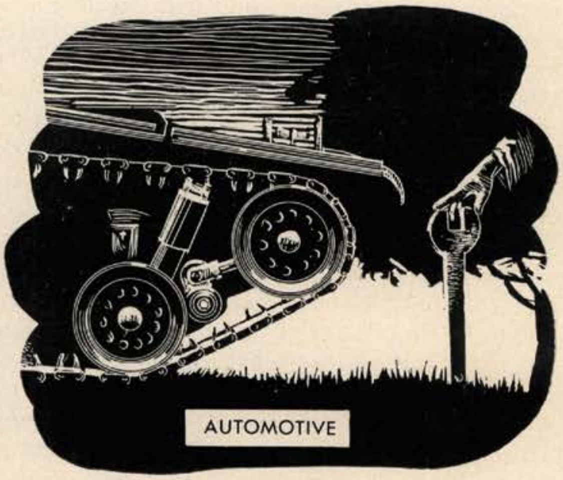
Other test stations during the final

FIELD PROFICIENCY TEST

INTELLIGENCE

COMMUNICATIONS

MAP READING



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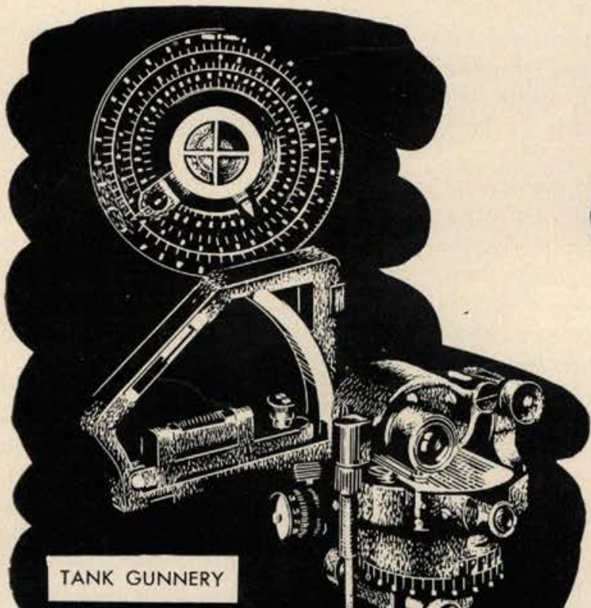


TANK GUNNERY

RECOVERY

MINE FIELD CLEARANCE

phase of the exercise impose demands on knowledge of field engineering, mine warfare, map reading and field expedients. The inclusion of these requirements does not eliminate the constant evaluation of proper tactical conduct, operation of communication facilities, tank gunnery and maintenance. The tactical atmosphere is maintained until the tanks are returned to the motor park.

The third day is occupied in after-action maintenance, turn-in of tanks and equipment and the final evaluation and consolidation of scores. The conclusion is signalized by the submission of the various reports and score cards to the senior control officers. The highest scores are announced and publicized, and appropriate awards are presented.

GUNNERY PROFICIENCY COURSE

While training tank crewmen in gunnery during World War II, many armored commanders soon realized that satisfactory qualification of tank crewmen in their individual firing duties did not necessarily indicate combat readiness in tank gunnery. This realization led to the introduction of various types of field firing exercises; some of these simulated combat situations, others were simple range firing problems. The type of exercise depended largely upon the commander and upon the time and facilities available. Although these exercises were not standardized, they served a common purpose: to ascertain and to build crew proficiency in gunnery. In 1945, FM 17-15, *Combat Practice Firing, Armored Units,* was published. This manual, although general in content, provided commanders with a guide for establishing crew and unit firing exercises. But only limited benefits were derived from its publications; with the exception of units stationed in Europe, few crew or combat firing exercises were conducted by armored units during the period extending from the conclusion of World War II to the beginning of the Korean conflict.

In 1951, General I. D. White, then Commandant of The Armored Center, directed that a Tank Crew Gunnery Proficiency Course be established and conducted by the Weapons Department. The objective was to provide a course in which basic gunnery principles, coupled with crew coordination, would be taught and tested. This course originally required the crew to utilize all weapons on the tank and to engage rapidly and accurately seven combat-type targets. In August 1954, a guide for laying out the course was published in Change 3 to FM 17-12. Subsequently a combat-type target, which would require the tank commander to utilize the fire of supporting weapons, was added to the course.

The primary purpose of the Tank Crew Gunnery Proficiency Course, as now conducted by armored units, is to develop and test crew teamwork and proficiency in gunnery. Other secondary but vital objectives are also included; the crew must develop an appreciation of the importance of maintenance and the necessity of compliance with correct operational procedure in maintaining and using the fire-control and communications equipment. The latitude and the flexibility of the course permit expansion to include other factors which are vital to successful tank operations in combat. One of these factors stresses the importance of engaging targets with the correct tank weapon and ammunition, thus ensuring an adequate supply of ammunition for the continuance of the mission; another factor emphasizes maintaining the momentum of the attack; an additional point acknowledges the value of reporting information of the enemy; other tests indicate the tank commander's ability to call for and adjust the fire of support weapons and his knowledge and proper use of radio procedure. All of these useful by-products are incorporated in this course.

The possible score for the course is 1100 points and the qualifying score is 715 points. The scoring is based on the number of target hits, initial fire commands, method of fire, opening of fire within the prescribed time limit, target coverage and completion of fire within the prescribed time limit. Points are deducted from the total score for each minute over 20, which is accepted as the standard length of time in which the crew should complete the entire exercise. Points are also subtracted for failure of the tank commander to render reports of enemy contact to his platoon leader after engaging targets 3, 4, 5, 6, and 7 as shown on the sketch.

The exercise is presented to the students while they are attending the block of instructional units offered by the Weapons Department. Naturally they receive prior information in the form of schedules, advance sheets and directives for crew organization. Immediately upon their arrival at the range where the test will be administered, they are briefed by the officer in charge. As a training aid he employs a scale model of the course while he explains the situation, routes and targets. In discussing the targets he gives the reasons why each type is included in the course. The instructor might state:

> "Target Number One is placed in a ditch alongside the road because enemy troops often appear in that location. In addition, Target One illustrates the value of the grenades carried in the tank as effective weapons for the destruction of pinned-down enemy personnel who are near the path of the tank. Target Number Two serves another purpose; it is placed in such a position that it suddenly appears as the firing tank moves past its terrain feature shield. Why is this so important? *Tank crewmen must learn to closely observe for targets as the terrain unfolds."*

Following this detailed analysis of reasons for the inclusion of different targets, the instructor, in order to stimulate interest, presents the tactical setting in the form of a general situation.

> "Division has been attacking north with the mission of seizing crossings over Salt River and continuing the attack to the north to capture the key communications center of Louisville (30 miles north of sketch). The 1st Tank Battalion, of which you are a member, has been attacking north generally astride Highway 251 with the mission of seizing the

U. S. Army

Hours of practice on the tank trainer are a basic requisite prior to the final examination—The Tank Proficiency Course.

Woolridge Ferry Bridge over Rolling Fork River and the Salt River Bridge, vicinity of Shepherdsville. Thus far, only scattered resistance has been encountered. The battalion has halted temporarily in this vicinity (indicates location on the sketch) for the purpose of refueling. Elements of the 301st Reconnaissance Battalion report squad and platoon-size enemy groups operating in the Cedar Creek valley. You are the tank crew of the leading tank. Just prior to moving out to continue the attack, your platoon commander informs you that the supporting artillery has registered on concentrations along your route and he directs you to plot these concentrations on your map. He also warns you to be on the lookout for a friendly reconnaissance patrol in the general area of the Cedar Creek Bridge."

Following this orientation, the crews are directed to the nearby tanks; each crew makes a detailed check of its tank under the supervision of a qualified noncommissioned officer. The next phase is a "dry run" of the course. While the students are engaged in that activity, the accompanying instructor again explains the concept of the course and emphasizes the minor but necessary techniques and tricks of the trade that should be employed during the engagement of each target. When the crew returns from the "dry run," the ammunition is inspected and loaded in the tank. Once the crew starts the firing run, the instructor becomes a silent observer; he maintains this role as long as the crew adheres to the concept of the course and observes all safety precautions. His principal activity now is to keep time and score the crew on its performance. After the firing run has been completed and the tank returns to the starting point, the instructor completes the score card after obtaining the target hits. He then assembles the crew at the critique board and conducts a detailed conference on the conduct of the exercise. It is in this critique that the mistakes of the crew and the basic teaching points are analyzed and reviewed.

The Weapons Department is convinced that the course constitutes an important phase in the training of tank crews, presents a realistic picture of crew duties while firing all tank weapons and assists in training of armored leaders by instilling in them an appreciation of crew coordination, teamwork and methods of properly engaging field targets.

Conclusion

It is readily acknowledged that these five practical field exercises do not represent a distinctive innovation of The Armored School. Such instructional and testing devices have long been accepted and utilized in our military service schools and in the training programs conducted by service units and organizations. Training manuals constantly emphasize the value and place of this type of instruction in all training programs.

What The School has done, however, is to cast these exercises in an Armor setting which emphasizes not only the application of Armor concepts but also the integrated use of a variety of technical skills. Armor does impose special demands upon automotive maintenance and operation, radio communication and gunnery. But technical proficiency in these fields is not sufficient; throughout the conduct of all these exercises the theme of Armor is proudly proclaimed: mental alertness, aggressiveness, boldness, initiative and high mobility.

The School is not content to remain satisfied with the present program. The current exercises are constantly being revised and improved; additional courses, such as a contemplated leadership proficiency test, will be introduced. The objectives of this type of instruction, as well as the more formal classroom lessons, actively seek to produce Armor officers capable of fully exploiting the potentials of armored warfare.

NEWS NOTES

New Rifle Marksmanship Concepts Being Tested

A new concept of training designed to improve the Army rifle marksmanship program is currently being tested, the Department of the Army announced recently.

Tests now being conducted by the 8th Infantry Division, Fort Carson, Colorado, and the 101st Airborne Division, Fort Jackson, South Carolina will determine if an "experimental" basic course of rifle marksmanship instruction is superior to the present "known-distance" instruction used by the Army in its basic combat training program.

The "experimental" concept, named TRAINFIRE, was developed by Headquarters Continental Army Command Human Research Unit Number 3 at Fort Benning, Georgia. It reproduces in training many of the marksmanship problems encountered by individual riflemen in combat, and is designed to develop, in a minimum time and with minimum expense, a rifleman who can detect and engage combat targets effectively.

TRAINFIRE is based on three fundamental principles: the combat rifleman's targets consist of enemy personnel; these targets rarely appear beyond 300 yards, and his effectiveness as a rifleman depends upon his ability to neutralize individual targets. The "experimental" concept reduces marksmanship training time from the present 86 hours instruction during the first four weeks in the 16-week basic training to 74 hours. It also reduces the number of rounds of rifle ammunition required for this training.

The principal advantage envisioned by TRAINFIRE usage is that it provides combat realism in the initial phase of rifle instruction. This is accomplished by reducing fire at bull's-eye type targets and eliminating the "known-distance" target ranges now used in training in favor of 1000-inch ranges and low outline targets at unknown ranges. TRAINFIRE makes extensive use of camouflaged targets to obtain maximum battlefield realism, while soldiers engaged in detection and firing training on its ranges are required to fire from combat-type positions.

Realism of targets is provided by using the Army's new pop-up silhouettes, called "Pop-up Petes," which simulate the enemy and are exposed at irregular time intervals, briefly and at unknown distances not exceeding 300 yards. Both stationary and moving targets are used. These targets are electrically powered, remotely controlled, cardboard silhouettes that fall automatically when hit by a bullet. They can be raised or lowered through the remote control system operated by the instructors.

Other methods of rifle marksmanship instructional practices offer innovations in training designed to produce better riflemen. These include quick selection of firing positions, firing in combat uniform, introductory firing almost immediately after training begins instead of "dry run" instruction, elimination of need for trained personnel to maintain and score targets in the target pit area, alleviation of fear of the rifle by early introductory firing and emphasis placed on realism during the entire 74-hour training period.

The concept will undergo comparative testing at Forts Carson and Jackson. Two companies approaching their marksmanship training will be paired —one to operate TRAINFIRE and the other to take conventional marksmanship instruction. Results of both companies will be tabulated and compared in order to rate the two systems. The tests will be repeated with different companies until June 1956. After careful evaluation, the Army will decide which method is the better.

Although the effectiveness of training is the decisive principle in the test, such factors as economy of operations, adaptability in times of emergency and durability and desirability of pop-up type targets will affect the Army's choice.

New Wehrmacht to Get 1,300 U. S. Tanks

The German Army will have more than 1,300 tanks, the Defense Ministry announced recently. A spokesman said most of them would be the American M47 tank.

German Army planners also are hoping to get some M48 Patton tanks, the latest type now in service with the United States Army. The M48 mounts a 90 millimeter gun, weighs 97,000 pounds and costs almost $110,000.

The United States has agreed to deliver a "considerable quantity" of arms to the new West German Army.

The spokesman gave this timetable for the Army buildup, which he said was subject to Parliament's approval of the necessary legislation in time:

1. Three skeleton infantry divisions to be formed by April 1 by incorporating the 18,000 man Federal Frontier Force into the army.

2. These three motorized divisions to be brought to their full strength of 12,000 each by October 1 by enrolling more volunteers.

3. The skeletons of six armored and three more infantry divisions to be formed by October 1.

4. All 12 divisions to be brought to full strength and combat readiness by January 1, 1959, by drafting men of 18 and 19.

The spokesman said the army would have a total strength of 370,000 men.

The coastal navy and tactical air force would make up the remainder of West Germany's 500,000 man contribution to the North Atlantic Treaty Organization.

Army Awards Contract for Self-Propelled Gun

A contract for approximately $23,500,000 covering production of the M-42 Twin-40mm Self-propelled gun has been awarded to the Cadillac Division of General Motors, the Department of the Army announced recently.

Production under the new contract will be in the Cleveland Tank Plant which Cadillac has been operating for Army Ordnance, and will start when production under an existing contract for this combat vehicle is completed about May of 1956.

As a result, plant employment will remain at approximately the present level.

Project Vanguard

Work has begun on Project Vanguard, which is the project name assigned to the scientific satellite announced on July 29 of last year by President Eisenhower, the National Academy of Sciences, the National Science Foundation and Secretary of Defense Wilson. The Defense Department's participation in the satellite project will be accomplished as a joint Army-Navy-Air Force program under Navy management. The program includes use of Army and Air Force facilities.

The small, earth-circling unmanned satellite will be included in the final stage of a multi-stage rocket launching vehicle. The system will be launched some time during the International Geophysical Year (July 1957—December 1958) from a site to be selected soon on a scientific and functional basis.

The Glenn L. Martin Company, of Baltimore, Maryland, builder of the Viking rocket for the Navy, has been awarded the prime contract for a major part of the project, the rocket launching vehicle and other important portions of have been an important factor in the success of the Viking rocket development used in upper air research.

The General Electric Company will supply the rocket motor which will be used in the first stage of the launching vehicle, and other important portions of the launching vehicle will come from different industrial sources.

Although the exact shape and size of the scientific satellite itself have not yet been determined, and it will be small, it will be large enough to contain a number of instruments and to be tracked from the ground by optical and radio devices.

Vanguard, the first man-made satellite, will be established in its orbit around the earth in this general manner: The first rocket will start the entire assembly vertically on the first part of its flight. When its fuel is exhausted, the first stage will drop off, and the second rocket, deflected from the vertical, will continue the satellite upward. The third rocket, carrying the satellite proper, will accelerate it to a top speed of about 18,000 miles an hour, which will establish the satellite in its orbit, where it will continue under its own momentum. This high velocity is required to balance the centrifugal force of the satellite against the earth's gravitational pull.

The satellite's orbit will be elliptical rather than circular, and, at its nearest approach to the earth, or perigee, may be approximately 200 miles distant. The satellite will circle the earth once every one or two hours, for several days. The cumulative effect of the drag of the earth's atmosphere, thin though it is at a 200-mile altitude, will still be sufficient to bring the satellite gradually closer to the earth. The friction of the air as the satellite enters the denser atmosphere will cause it finally to disintegrate in much the fashion of a "shooting star."

The purpose of this scientific satellite project is to augment the upper atmosphere research which will be conducted by the United States during the International Geophysical Year, a scientific program which will utilize rockets, balloons and rocket-balloon combinations. Accordingly, detailed information on the satellite itself, including the instrumentation and its orbit, will be shared with the scientists of some 40 nations participating in the IGY.

19 Combat Divisions Goal in FY 1957

An adjusted deployment plan and a divisional strength goal of 19 Active Army combat divisions for fiscal year 1957 was announced recently by the Department of the Army.

The plan has been approved by the Secretary of Defense and the President.

In the Far East, the principal change affects the island of Okinawa, where certain Army tactical troops will be replaced by elements of the 3d Marine Division. This will result in the inactivation of the Army's 75th Regimental Combat Team. The Army will retain command in the Ryukyus and also keep civil administration and cross-servicing responsibilities.

An additional change in the Far East will be the movement of the 508th Airborne Regimental Combat Team from Japan to Fort Campbell, Kentucky, beginning in June 1956, to become a part of the new Airborne Division to be activated there. The Army announced on November 25, 1955, that the 187th Regimental Combat Team would also become a part of this new division.

The 23d Infantry Division, with headquarters at Fort Amador in the Panama Canal Zone, will be inactivated, as will the 65th Infantry Regiment stationed on Puerto Rico. The other regiments of the division will be retained as active Regimental Combat Teams. Remaining on Puerto Rico will be approximately 1400 Army personnel.

The 25th Infantry Division will remain in Hawaii.

The 9th Infantry Division will be stationed at Fort Carson, Colorado, when it returns from Germany starting in August 1956. The exchange of stations under Operation GYROSCOPE for the 8th and 9th Infantry Divisions was announced in early November, but the home station of the 9th Division was not designated at that time. The 8th Division is now located at Fort Carson.

Activation of 101st Airborne Division

An Airborne Division to be activated early in 1956 at Fort Campbell, Kentucky, as previously announced, will be designated the 101st Airborne Division, the Department of the Army announced recently.

Full composition of the Division has not yet been determined. The Army announced recently that personnel of the 187th Airborne Regimental Combat Team, now at Fort Bragg, North Carolina, and the 508th Airborne Regimental Combat Team, now in Japan, will be integrated into the new Division.

The designation of the 101st is now carried by the Training Division at Fort Jackson, South Carolina. Training center functions will remain at Fort Jackson when the division designation is moved to the new Active Army unit at Fort Campbell.

Activation of the 101st Airborne Division will bring back into the Army's combat structure one of the oldest and most famed Airborne Divisions. The 101st was originally constituted in the Organized Reserve in 1921, but remained inactive until it was redesignated an Airborne Division on August 15, 1942, along with the 82d Division, to become one of the Army's first two Airborne Divisions.

The 101st had a colorful history in World War II, being particularly known for its defense of Bastogne in the Battle of the Bulge. For this action the entire division was cited by the President and awarded the Distinguished Unit Citation. Additional battle honors of the 101st Airborne Division include the Distinguished Unit Citation for Normandy, the Belgian Fourragere and the Netherlands Orange Lanyard.

Army ROTC Graduates

About one-third of the 6,000 Army Reserve Officer Training Corps graduates scheduled to enter active duty during the first six months of 1956 will serve normal two-year tours according to present plans, the Department of the Army announced recently.

The remainder, some 4,100 ROTC graduates, will be called for six months' active duty, it is now planned, after which they will be assigned to active participation with Reserve units.

It was pointed out that the present program affects only those ROTC graduates who have received or will receive commissions before April 30, 1956. A program for June 1956, graduates will be announced at a later date.

The Army said that a reduced requirement of the Active Army for junior officers and an increase in the number of Reserve officers voluntarily remaining on extended active duty permits this move at a time when junior officers are particularly needed to bolster Reserve forces.

Quotas for the two-year active duty training will be filled first by Distinguished Military Graduates who have applied for Regular Army commissions and by volunteers. The remainder needed, if any, to reach prescribed quotas in this group, will be selected by standard methods to meet branch of service requirements.

Officers selected for six months of active duty instead of the two-year tour will join and train with Ready Reserve units after their active duty training.

news from THE ARMORED SCHOOL

Special Weapons Orientation Course

In application of the current Armored School emphasis on atomic warfare, the Special Weapons Division of the Command and Staff Department is now presenting an orientation program for instructors in that department. Under this program, instructors attend a twenty-four hour course of instruction, the bulk of which deals with technical aspects of the subject. Target analysis and computation of troop safety factors are typical of the subjects learned. Slide rules, charts and graphs are used in the solution of the many problems presented to the class.

The first course was presented during the week 14-19 November and included in its student body, in addition to officers from the Command and Staff Department, personnel from The Armored Center G3 Section and instructors from the Automotive Department of the School.

It is planned that the course will be presented periodically until all officers of the department have attended.

Proposed Changes to Tank Gunnery Qualification Course

Some important changes to the Tank Gunnery Qualification Course have been recently proposed by CONARC. Details are given in a CONARC letter, distributed to all field armies, dated 18 November 1955, subject: "Proposed Changes to Tank Gunnery Qualification Course."

Recommended changes provide a limited course consisting of Table I, II, III and IV which can be fired on one range site. The big change is a new Table III which requires the gunner to zero the machine gun, then fire a first round hit and a burst-on-target exercise. The purpose of this table is to teach and test the crewmen on how to fire a subcaliber exercise which employs many of the principles he must apply in the service firing tables.

There are other changes in the subcaliber and service tables which will be of interest to commanders who are making plans for qualification firing.

The present Table III (moving tank) is a worthwhile exercise and should be fired as a prerequisite to tank crew proficiency and tank-infantry combat courses. It is not being recommended as an exercise in the qualification course.

Units are authorized by CONARC to use the proposed changes in the conduct of qualification firing for the year 1956. Final adoption of the proposed changes will be made after units in the field have had an opportunity to test and evaluate them.

Safety in Water Operation Armored Infantry Vehicle M59

The Armored Infantry Vehicle M59 is capable of operating in water of any depth. *When operated in water, all precautions normally exercised for any water-borne vessel should be applied.* Before entering the water, the four drain plugs under the hull at the front of the vehicle should be checked to see that they are installed and are tight. Inspect the ramp to see that it is tightly closed and locked. *The trim vane should be extended and all hatch doors closed.* The hatch doors and the commander's cupola should remain closed in rough water and during all water operations if the situation permits. Before the vehicle enters the water, the bilge should be pumped dry to prevent bilge water from surging forward causing the front of the vehicle to nose down. If the bilge is dry, the operation of the bilge pump should be checked. This can be done by placing the vehicle on a slight incline and pouring a few gallons of water around the pump. This is the only positive method of testing the bilge pump for proper operation. If the situation does not permit this test, the bilge pump drive belt should be inspected to see that it is not broken or slipping. Use low range drive to prevent imposing unnecessary loads on the hydramatic transmission.

While operating afloat, do not exceed the maximum load limit. A minimum of 13 inches freeboard should be maintained and *cargo or personnel load should be balanced to ensure a reasonably level trim* or a trim with the front slightly up. This will allow bilge water to reach the bilge pump in the rear of the vehicle and will also reduce the possibility of water being shipped over the front of the vehicle. *Maintain a reasonably level horizontal trim to avoid yawing and the resultant more difficult steering.* The maximum speed in water is 4.3 MPH (12 MPH on speedometer).

Most modern small boats will remain near the surface when swamped. *The AIV M59 will not.* Play it safe and study the banks and the action of the water. Make a prior reconnaissance before entering the water.

When leaving the water, approach land squarely with reduced track speed to prevent sudden shocks on the tracks. River banks in excess of 40 per cent slope are difficult to negotiate. In emerging from a river with banks in excess of a 40 per cent slope, there is a tendency for the tracks to dig into the bank, creating an artificial slope that may approach the vertical. Extremely dense, muddy banks with slopes of 10 to 20 per cent will be difficult to negotiate because of the tracks slipping in the soft mud. It is recommended that the safe limit of bank slope be established at approximately 40 per cent with due consideration to the nature of the soil, using gentler slopes in muddy bank conditions.

The surface of the water will tell you many things. The riffles over a submerged rock cropping—the swirling water around a sunken piling—the appearance of your wake when you reach shallow water—all these tell their story to the experienced AIV Commander. Since the speed of the AIV is slightly over 4 MPH in deep water, it is obvious that if the current exceeds 4 MPH the vehicle will be unable to go upstream. In crossing a river the AIV will drift downstream; the distance depending upon the speed of the current and the width of the stream. If the river bottom is smooth and deep and the surface of the stream is not extremely turbulent, it may be possible to cross such a river even though the current exceeds 4 MPH. However, until further experience is gained in operating the AIV under various river conditions, it is suggested that a tentative limit of 4 MPH river current be established as the safe operating limit.

Watch the weather, even rivers can get rough if a strong wind blows upstream.

It is difficult to evacuate the AIV M59 wearing a kapok life preserver. It is suggested that large men sling the preserver over one shoulder until they are clear of the hatch. The "Mae West" life preserver is recommended for AIV M59 personnel.

Gasoline explosions and fires are chief causes of accidents on small power boats. The AIV M59 is powered by engines using gasoline as fuel. Make sure there are no leaks in the gasoline tank or fuel lines. Examine fuel valves and carburetors, and repair or replace them immediately if there is even the slightest indication of a leak. If, in spite of all precautions, gasoline does get into the AIV, do not attempt to start an engine until all of the gasoline is removed. If gasoline gets in the bilges, dry the bilges completely and then wash them out thoroughly until all traces of gasoline odor have disappeared. Gasoline vapors are heavy, sinking to the bilge at once and are highly inflammable and explosive when present even in small quantities. Vapor will remain in the bilges indefinitely unless removed by proper ventilation.

The greatest danger in ferrying operations is collision. The risk of collision exists in three situations. These are the meeting situation, the passing situation, and the overtaking situation.

When two AIVs approach each other head on, each should turn to starboard (right) and pass the other AIV on her port (left) side. Start the turn in ample time so that the approaching AIV will know your intention.

When you are overtaking another AIV, you may pass on either side, provided there is ample space; but remember the AIV being overtaken has the right-of-way.

When passing another AIV, watch its wake and course carefully. Cross the wake at an angle of at least 45 degrees. Keep well away.

New Communication Officer Course

The Armor Communication Officer Course has been revised to provide a more compact and better sequenced program of instruction for the prospective Communication Officer. The first class which ended 18 October 1955 was the regular 12 week course. However, based on the recommendations of this class and on reports from the field, the 12 weeks' course was revised so that the next class will receive a more compact program of instruction. Therefore, the next course will be of 10 weeks duration and will begin 12 March and end on about 22 May 1956. At present two Communication Officer Courses are conducted each year.

During the past year, the thinking of the Staff and Faculty of the Communication Department, coupled with comments from students in Communication Officer Classes, has indicated that certain basic changes in this course would be desirable.

In analyzing the requirements of the Armor Communication Officer's mission, it was determined that he must be trained to plan and supervise the installation, operation, and maintenance of Armor communication systems. Therefore, the Communication Officer must have a practical and a theoretical knowledge of armor communication equipment and systems. To do his job, the Communication Officer does not need, nor should he be required, to be a specialist in a technical sense, *e.g.* a CW radio operator. It then follows that the time devoted to radiotelegraph (code practice) in the old 12 week course could be better utilized on other subjects. Moreover, the time allocated, even though it amounted to some 46 hours, was not sufficient for the Communication Officer to develop any degree of proficiency as a CW radio operator.

The major changes in the program of instruction are brought about by the deletion of certain types of instruction, the addition of new and more appropriate subjects and a change in sequence of the over-all course.

Under the first change, the number of hours of radiotelegraph procedure and code practice has been greatly reduced so that the next class will get only a familiarization with radiotelegraph procedure supplemented by instruction on the establishment, operation and supervision of a unit CW operators school. New units on Combat Photography, CPX Planning and writing, Communication Systems and Tactical Communications, including night blackout exercise, have been added. The amount of time spent in developing individual skill with wire equipment and wire systems has been substantially reduced. This revision will permit more emphasis on radio equipment and systems and on supervisory responsibilities which present the major problems to the Armor Communication Officer.

In the sequence of instruction, the student will first receive 63 hours of electrical and radio fundamentals—he will then receive instruction on the operation and maintenance of FM and AM radios. Following this, he will be given instruction on wire equipment and unit tactical communication systems. The course will terminate with several field exercises and an 8-hour organizational maintenance exercise with the student applying the knowledge gained earlier in the course.

The Communication Department believes this course has the two-fold advantage of being compact and yet giving the prospective Communication Officer essential information to perform his duties as a unit Communication Officer.

Armor Extension Course Honor Roll

Only one extension course student has been placed on the honor roll during November and December 1955. This outstanding student is Captain William C. McConnell, 354th Infantry Regiment, US Army Reserve (Colorado).

Key Personnel Changes

Colonel Henry Frankel, Chief, Allied Liaison Section, has been reassigned as G2, The Armored Center.

Lt. Colonel W. H. Stufflebeam, Director, Training Literature and Reproduction Department, has been reassigned as Commanding Officer of the 30th Tank Battalion at Fort Knox.

Major J. G. Kingsley is now Director of the Training Literature and Reproduction Department.

Lt. Colonel T. L. McLaughlin, Deputy Director, Automotive Department, departed for an overseas assignment to the Far East.

Captain J. V. McKeever is now in charge of the Book Department.

"How would you do it?"

GENERAL.

Armor has great firepower. However, in order to develop its decisive abilities, Armor must close with the enemy. The tank gun should **not** be considered as artillery, even when it fires HE, because of the high velocity and relatively small bursting charge of its ammunition. But experience from World War II and Korea has indicated that it is sometimes necessary to employ tank units in a secondary role of providing indirect fire. There is no doubt that the decision to use tanks for indirect fire should be made only when absolutely necessary. When they are so employed, they must be laid so as to provide an effective pattern of fire.

SITUATION.

You are a platoon leader in the left reinforced battalion of a combat command. The combat command is in the exploitation phase of an operation designed to seize multiple crossings over River **R**. The leading reinforced platoon succeeded in seizing the bridge at **B** intact; however, as the tanks of this platoon began to cross the river, an enemy air strike damaged the bridge, and the first tank of the platoon fell through it. The river is unfordable, and all of the other bridges have been destroyed. The supporting engineers have begun work on the bridge and estimate that they will have it repaired in two hours. Meanwhile, the two armored infantry companies of the reinforced battalion have crossed the river in their armored infantry vehicles and are digging in on the high ground at **A**. The battalion commander, after going up in an Army aircraft to look over a reported enemy build-up area in the vicinity of the road junction at **Y**, orders that all of the tanks south of the river will fire on this build-up area. The tanks of your platoon are located as shown on the sketch. The area at **Y** cannot be seen from your position; however, the armored infantry commander at **A** and the pilot of the Army aircraft can observe your fire on **Y**. From your position at the center (Nr 1) tank, you can see a large radio tower near the town at **M**, at a map range of 16,000 yards. You can also see a small strip of the road beyond (north of) the road junction at **Y**. The commanders of all the tanks in your platoon can see the radio tower, but none of them can see the strip of road near the road junction at **Y**.

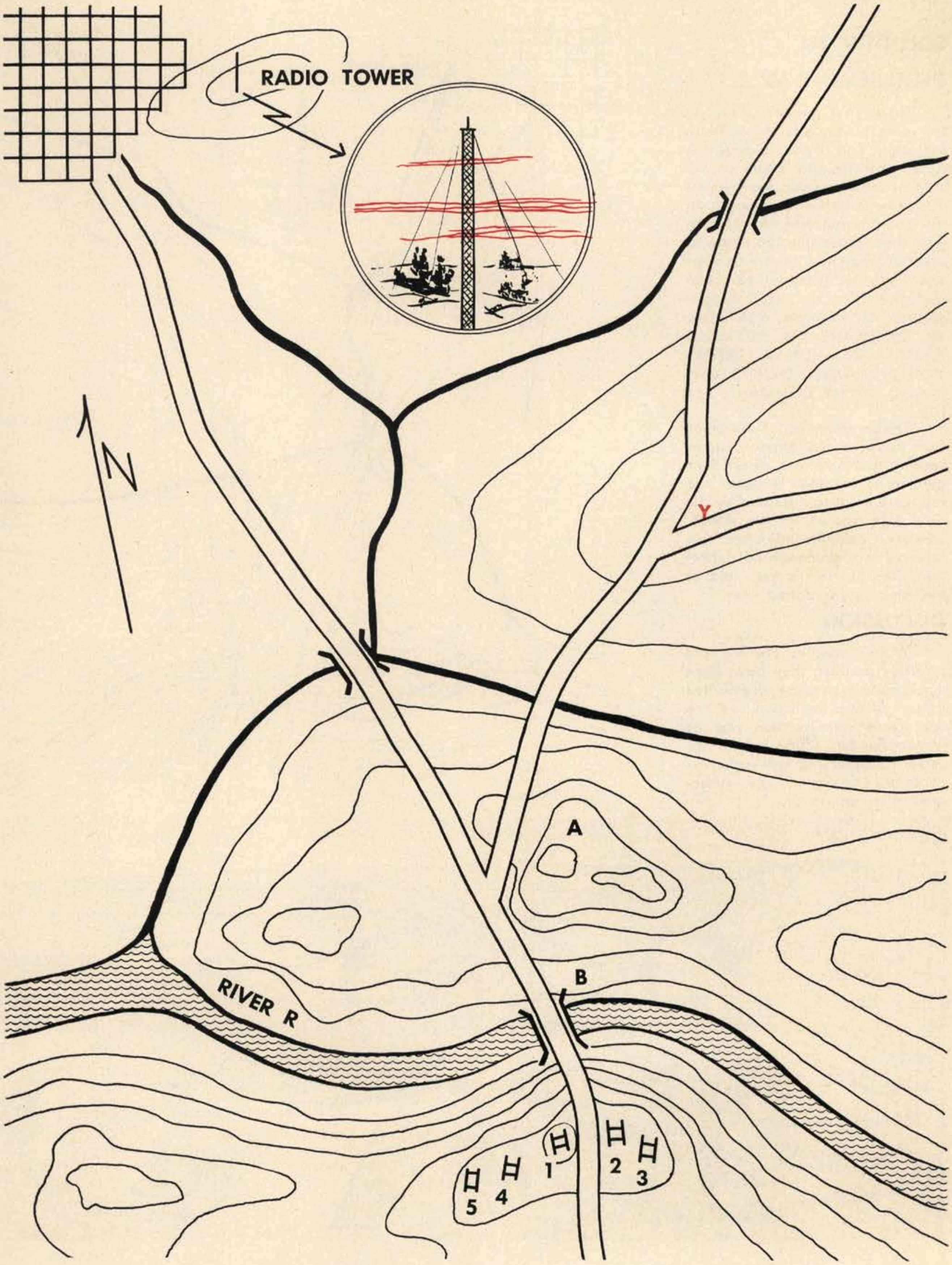
REQUIREMENT NR 1.

How would you lay your platoon to fire on the target at road junction **Y**?

REQUIREMENT NR 2.

What item of organic equipment would you use for computing initial elevation and the subsequent deflection and range corrections called in by the observers?

ILLUSTRATED BY MR. JACK BAIN


RADIO TOWER
N
Y
A
B
RIVER R
1
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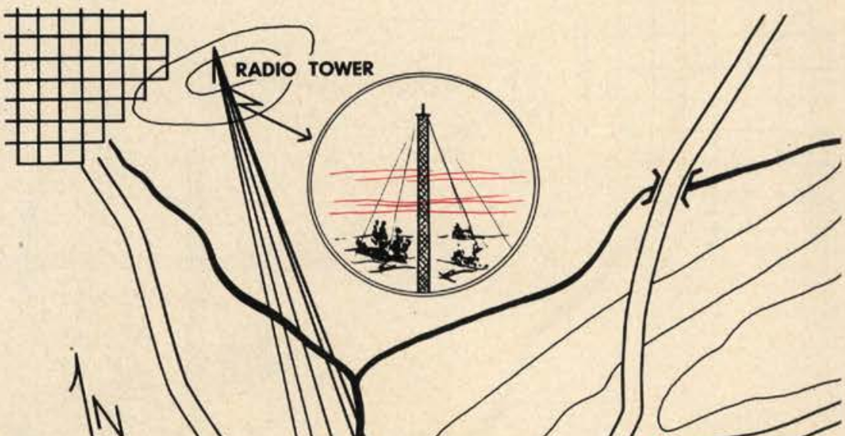
SOLUTION TO REQUIREMENT NR 1.

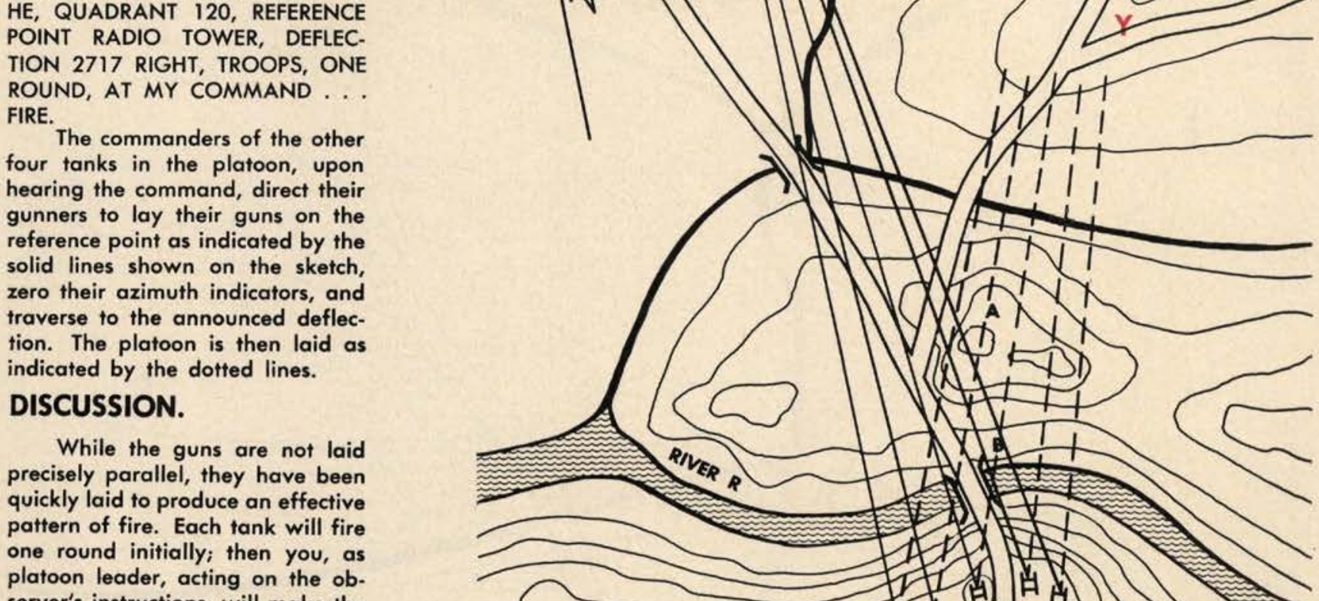
Have your gunner to lay on the radio tower, zero the azimuth indicator, and then traverse the turret until the gun is laid on the strip of road you can see beyond **Y.** Note the deflection reading on the azimuth indicator. Next, from your map, determine the range to the road junction at **Y.** Convert this range to quadrant elevation and give a fire command to your platoon; for example: PLATOON, HE, QUADRANT 120, REFERENCE POINT RADIO TOWER, DEFLECTION 2717 RIGHT, TROOPS, ONE ROUND, AT MY COMMAND . . . FIRE.

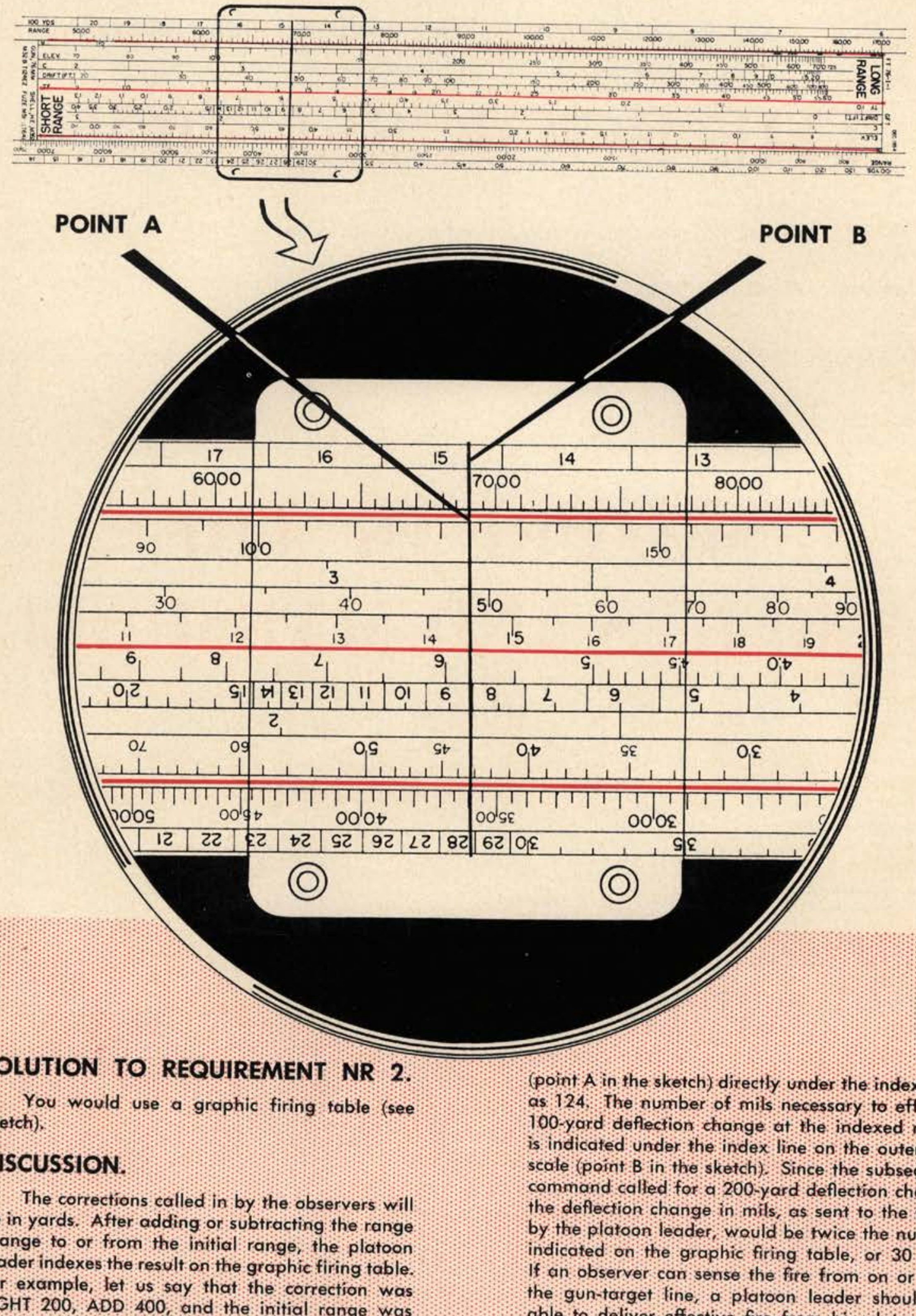
The commanders of the other four tanks in the platoon, upon hearing the command, direct their gunners to lay their guns on the reference point as indicated by the solid lines shown on the sketch, zero their azimuth indicators, and traverse to the announced deflection. The platoon is then laid as indicated by the dotted lines.

DISCUSSION.

While the guns are not laid precisely parallel, they have been quickly laid to produce an effective pattern of fire. Each tank will fire one round initially; then you, as platoon leader, acting on the observer's instructions, will make the necessary corrections by subsequent fire commands.







SOLUTION TO REQUIREMENT NR 2.

You would use a graphic firing table (see sketch).

DISCUSSION.

The corrections called in by the observers will be in yards. After adding or subtracting the range change to or from the initial range, the platoon leader indexes the result on the graphic firing table. For example, let us say that the correction was RIGHT 200, ADD 400, and the initial range was 6500. The index line on the graphic firing table would be centered over 6900. The quadrant for this new range is indicated on the elevation scale (point A in the sketch) directly under the index line, as 124. The number of mils necessary to effect a 100-yard deflection change at the indexed range is indicated under the index line on the outermost scale (point B in the sketch). Since the subsequent command called for a 200-yard deflection change, the deflection change in mils, as sent to the tanks by the platoon leader, would be twice the number indicated on the graphic firing table, or 30 mils. If an observer can sense the fire from on or near the gun-target line, a platoon leader should be able to deliver effective fire from his platoon by use of a map and a graphic firing table. If no graphic firing table is available, he can use the mil formula and a firing table.

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SEIZURE OF THE GILBERTS AND MARSHALLS

Reviewed by

GENERAL ROBERT L. EICHELBERGER

General Robert L. Eichelberger graduated from USMA in 1909. During World War II he served in the Pacific. Prior to the War he was Superintendent of the Military Academy. He was assigned as Commanding General of the 77th Infantry Division in March 1942. In June he assumed command of I Army Corps and took that unit to Australia. He commanded the first American-Australian units in victory over the Japanese Army. He assumed command of the Eighth Army in September 1944 and led it through combat and the occupation of Japan until he returned home in September 1948. Retiring in December 1948, he has been a consultant on the Far East in the Department of the Army. He is the author of "Jungle Road to Tokyo." He is engaged in preparation of another book which is slated for release in '57.

THE CO-AUTHOR

Edmund G. Love received his Master of Arts degree from the University of Michigan. During World War II he was a Captain of Infantry with the 27th Infantry Division in the Pacific. He was the Division historical officer during the invasion of Makin, Eniwetok, Saipan and Okinawa. He was with the Pacific Section of the Office of the Chief of Military History, Department of the Army during the three year period from 1946 to the Summer of 1949.

THE CO-AUTHOR

Doctor Philip A. Crowl received his Master of Arts degree from the University of Iowa and his Doctorate from Johns Hopkins University. During World War II he commanded an LCI in the Pacific. He was Assistant Professor of History at Princeton University from 1945 to 1949. He is Co-author of the book entitled "The U. S. Marines and Amphibious War." He is with the European Section of the Office of the Chief of Military History, Department of the Army.

Modern warfare as it is—a statesman's decision, a factory's production line, a general's command, a ship's salvo, a bombardier's drop, and, finally and ultimately, the lowly foot soldier facing the enemy, with his rifle in hand.

THE SEIZURE OF THE GILBERTS AND MARSHALLS. By Philip A. Crowl and Edmund G. Love. 414 pp. Government Printing Office, Washington, D. C. $5.75

THIS volume has been prepared in the Office of the Chief of Military History, Department of the Army. It is one of a series covering the war in the Pacific in World War II and should be fascinating reading to any of the hundreds of thousands of men who served in that theater of operations. To those who took part in amphibious landings and ground fighting against the Japanese many vivid memories will arise when reading this fine work. The authors served in the Pacific and know of what they write. Certainly this book is objective and fair to all concerned. As far as is humanly possible it is factual.

The story opens with a discussion of strategy in the war against Japan, leading up to the decision to make the islands of the Central Pacific the main avenue of approach. The plan to return to the Philippines via the

Press Assn.

Infantry storming the beach at Makin Atoll, ablaze from Naval bombardment, as American forces seized this Island Atoll.

Central Pacific Islands was not a new one and it was the approved concept in what was called the Orange Plan (possible war against Japan) during the days that General MacArthur was Chief of Staff. Nevertheless, it is not surprising to find that General MacArthur's reaction to a main effort through the Central Pacific was immediate and unfavorable.

Even though I served closely with General MacArthur through six long years in the Pacific, I still find many surprises and not the least is this statement in the second chapter:

"Although the 'Strategic Plan for the Defeat of Japan' had clearly indicated that the 'main effort' in the westward advance would be through the Central Pacific, there were still those among the various planning staffs in Washington—in addition, of course, to General MacArthur himself—who doubted the wisdom of giving the Central Pacific offensive priority over MacArthur's proposed drive against Rabaul. These doubts had to be resolved or the objections overruled before final plans for a Marshalls operation could be developed." One cannot quarrel with the statement that General MacArthur desired greater emphasis be put on his Southwest Pacific drive but I question that he seriously desired an attack on Rabaul. He had told me personally that he had been at one time in favor of attacking Rabaul but I did not know that serious study had been given to such a landing. As one who probably would have commanded the landing forces, I am interested and particularly so when I remember that over one hundred thousand Japanese surrendered at Rabaul after V-J Day.

Ultimately the Joint Chiefs of Staff approved a two-pronged attack, one through the Central Pacific Islands and one along the New Guinea axis. The former was definitely to be the "main effort" and with it went eventually almost unlimited strength in ships, planes and matériel of all kinds. General MacArthur, with little, went far. In any case, one cannot argue the merit of the major decision. The advance through the Central Pacific Islands was a great success and brings great credit to our high command, to our Navy and to an even greater degree to the simple fighting man on the beach or in the jungle.

When General MacArthur ordered a jump to Hollandia in Dutch New Guinea in April 1944 which completely bypassed a Japanese army, it was effected with small casualties. When Hollandia fell, the last great Japanese supply base on New Guinea was in our hands. His Hollandia decision was a momentous one for General MacArthur and was, to a large degree, responsible for his final successes. It seems likely to me that any commander of lesser prestige and force than General MacArthur would have been eliminated at some time during the drive through New Guinea.

In fact, as late as the Summer of 1944 General MacArthur was called to Honolulu and informed in the presence of President Roosevelt that the Philippines would be bypassed. He was thanked for successes attained that far but the drive through the Southwest Pacific was to be ended in New Guinea. His prestige and convincing arguments won President Roosevelt's approval for a continuation of his drive on the Philippines.

U. S. Army

Our amphibious doctrine received its critical test in the Gilberts and Marshalls.

While as stated above the final decision was to make the main effort through the Central Pacific, the attrition caused by American attacks on a wide front hastened the fall of Japan. Submarines based in Western Australia were an important factor in bringing about Japan's defeat, and the ships and planes destroyed by the Fifth Air Force in the SWPA from Australia through the Philippines weakened Japan and reduced her efforts in all the later fighting in such places as the Marianas and particularly at Okinawa.

Although aware of Japan's overextension in her initial advances into the Solomons, New Britain and New Guinea, I am surprised to read of the number of atolls in the Central Pacific which the Japanese held in force. There were not only many atolls defended by the Japanese in the Carolines, Gilberts and Marshalls but troops were often on many islands of the same atoll, a fact brought out plainly in the attack on Kwajalein. The numerous airfields, aircraft, supply bases, shipping, ground and construction troops on a broad front add up to a great dispersion of national effort. The totals in the mandated islands alone were tremendous.

The strategy of the Pacific operations having been covered, the volume tells of the actual operations against five central Pacific atolls, Makin, Tarawa, Kwajalein, Majuro and Eniwetok. In these attacks our amphibious doctrine received its first critical tests in the Pacific war. The lessons learned and the victories achieved made possible later successes in the Carolines, Marianas and Ryukyus and, in fact, all future landings in the Pacific.

Press Assn.

Tarawa was the most heavily defended Atoll invaded by Marines in the Gilberts.

As Crowl and Love point out, "Tarawa was the most heavily defended atoll that would ever be invaded by Allied forces in the Pacific. With the possible exception of Iwo Jima, its beaches were better protected against a landing force than any encountered in any theater of war throughout World War II." I am inclined to agree with General Holland M. Smith of the Marine Corps, the corps commander of the two simultaneous attacks, who from the vantage point of six years of hind sight felt that the operation against Tarawa was a mistake and that it should have been bypassed. Certainly at least two islands in the Gilberts were needed for advance air bases prior to the attack against the Marshalls. Except for errors, Tarawa might have proved a relatively easy victory and, in any case, one cannot question the selection of lightly held Makin as one of the two targets.

Certain difficulties were peculiar to both Makin and Tarawa landings. Hydrographic charts of both atolls were of little value. Air photographs and their interpretations were inaccurate so that the approach to the beaches at both targets met coral boulders which disrupted the advances and, in the case of Tarawa, resulted in heavy casualties.

By the time of the Gilberts operation, the great industrial power of the United States was beginning to be felt but certain types of equipment were still in short supply and this is particularly true of the amphibious tractor which became known as the alligator in later operations. General Holland M. Smith is quoted as saying "Without the amphibious tractor it is believed that the landing at Tarawa would have failed." I agree with this statement.

If the task forces had been equipped with many more LVTs (amphibious tractors) with well trained personnel, both operations would have been much less difficult.

The landing at Makin was made by the 27th Infantry Division. It had had no previous combat. The authors in covering this landing state with truth that the plan of attack for the ground forces violated the principle of simplicity. Anyone who made an elaborate plan to fight the Japanese in rubble or in a jungle was doomed to receive some sad surprises.

"Admiral Turner's staff," the authors say, "was satisfied that landing boats could get ashore there (at Makin) at any time. They were wrong. The reef was studded with coral boulders about forty yards off shore.

"Red Beach (on Makin) was a rubble of coral boulders and proved usable for only fifteen yards of its width. Only the absence of enemy opposition made possible a landing without heavy casualties."

The naval gun fire and air support were effective but as Admiral Turner pointed out "there was not enough of it." The landings in spite of the difficulties caused by natural obstacles were successful and there is little to criticize in the handling of army troops on D-Day.

In the days that followed, the advance was slow, the troops under fire for the first time showed all the usual reactions of green troops in a jungle fighting Japanese who would not surrender. Troops at times fired into one another and at times there was all-night firing on perimeters without Japanese opposition.

Communication between infantry and tanks was nonexistent and all means of communication suffered from rain and dampness. The first landing was made on 20 November and the last Japanese opposition was eliminated on the morning of 23 November.

There were only approximately 300 Japanese combat troops on the atoll and there is some justification for the statement by General Holland M.

Smith that the capture of Makin was "infuriatingly slow." It is doubtful, however, if there would have been any strong criticism of the action of the 27th Division if a Japanese submarine had not torpedoed and sunk an escort carrier on 24 November with more than half the crew aboard. The assumption was that if the action had been completed a day earlier the carrier would have departed. It is doubtful whether General Ralph Smith and his infantry staff were as conscious of the perils to the ships afloat as were General Julian Smith and General Holland M. Smith of the Marine Corps. In view of the many who could have been criticized for the costly mistakes at Tarawa, it is a bit difficult for me, as an old infantryman, to see General Ralph Smith singled out for special criticism while admitting that the remarks made about the 27th Division in its first combat are justified. Much of the fighting was in debris and jungle and it was small unit combat. Cautious advance reduces ground casualties but in this case, unfortunately, the Navy suffered more casualties than the ground forces.

In the attack of the veteran 2d Marine Division against Tarawa there were many mistakes. The plan for getting ashore at Tarawa was simple and the Marines under General Julian Smith never lost the spirit of the offensive. The 2d Marine Division also was a veteran unit and it had been well trained in the use of the alligator prior to sailing. In fact, one could say that at Tarawa the only thing that did not fail was the spirit of the offensive on the part of the Marines and great personal courage.

As at Makin, the preliminary naval bombardment was insufficient. Also at Tarawa naval gunfire at the beaches was lifted too soon. Air support was inadequate and was poorly coordinated with naval gunfire. As a result, when the Marines waded ashore over the coral they were subjected to accurate machine gun fire with consequent heavy casualties. More and better coordinated naval gunfire and air support would have reduced the casualties and made the landing much more simple.

Nevertheless, by the afternoon of D-Day five battalions of Marines had been committed at Tarawa. All but one had sustained heavy casualties and all were badly disorganized. In spite of the mistakes, the 2d Marine Division won out at Tarawa and deserves the highest praise.

The losses at Tarawa would have been unforgivable if the high command had not profited by the lessons learned. As a consequence, there followed relatively easy conquests in the Marshalls.

Air bases were secured in the Gilberts without which adequate bombardment and photographic reconnaissance of these more important targets would have been almost impossible to obtain.

Among the most interesting pages of this volume are the discussions of the enemy. We find the Japanese at the time of the abortive Carlson Raid on Makin in August 1942 in very little strength. Because of that raid the Japanese built up their power during the following year with the thought that the American main effort would come eventually through the island chain. Troops were stationed on many atolls, and air fields and bases constructed. Here was great dispersion of effort which extended from the Gilberts and Marshalls through the Carolines to New Britain, New Guinea and Indonesia. One wonders truly how the Japanese empire carried on so long. Perhaps the knowledge that the surrender was to be "unconditional" kept us from an earlier peace and caused the loss of the balance of power in the Far East.

Very good, too, is the discussion of the great Japanese fleet based on Truk in the Carolines as it searched for our fleet prior to the time of the Gilberts invasion. Eventually, however, in November at the time of the Bougainville landing Admiral Koga was forced to send his air strength to Rabaul. There he lost a very high percentage of his planes as well as six out of eleven heavy cruisers. This immobilized the Japanese fleet during the Gilbert Islands invasion.

In the discussion of the invasion of the Marshalls (the end of January 1944), the authors bring out the fact that the high command in the

U. S. Marine Corps

Under heavy enemy machine gun fire, Marines storm the air field on Tarawa.

Central Pacific under Admiral Chester A. Nimitz had decided to bypass more strongly held atolls in favor of Kwajalein. Centrally located and lightly fortified, it was a supply base in the Marshalls.

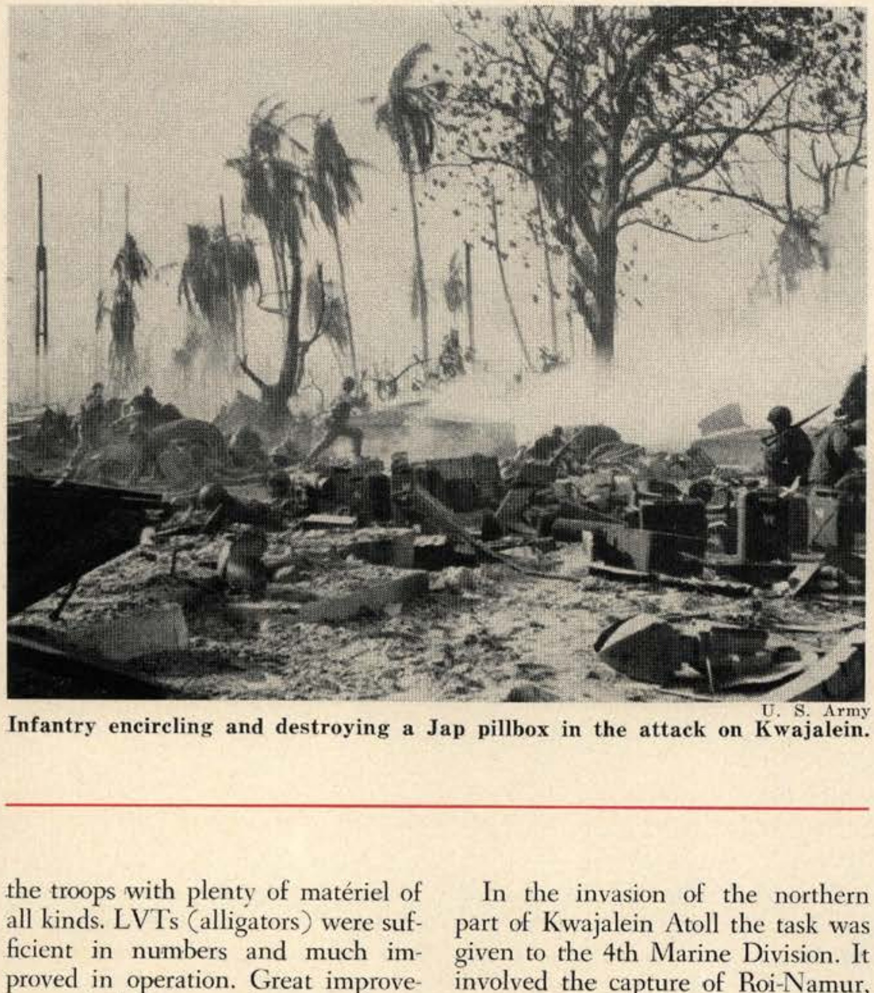
Our gunfire at the Kwajalein landings with its air and artillery support became a model for future operations. At Kwajalein Atoll the 7th Infantry Division and the 4th Marine Division made few errors.

In addition to the tremendous additions to our battleship and carrier fleets, the Kwajalein operation found the troops with plenty of matériel of all kinds. LVTs (alligators) were sufficient in numbers and much improved in operation. Great improvements had been made in matériel, particularly in waterproofing radios and flame throwers.

The occupation of islands covering the entrance channels to Kwajalein Atoll was well done and in the case of Kwajalein, the landing on Carlson Island permitted effective and heavy artillery support from the beginning. The fire from LCIs and DUKWs had been increased.

On reading the details of the wiping out of opposition on Kwajalein I question the descriptions of coordinated Japanese counterattacks in the dark. In the actual fighting there was the usual bravery on the part of the Japanese soldiers scattered through the debris resulting from the destruction of trees and buildings.

In any case, one finds little to criticize. The occupation of Kwajalein by our forces (7th Division) was not particularly fast but it was well done and losses were held to a minimum.


U. S. Army

Infantry encircling and destroying a Jap pillbox in the attack on Kwajalein.

In the invasion of the northern part of Kwajalein Atoll the task was given to the 4th Marine Division. It involved the capture of Roi-Namur, two small islands connected by an artificial causeway. Every type of hard luck happened on D-Day in getting ashore to occupy small neighboring islands. The 10th Amphibious Tractor Battalion met adverse winds and choppy seas which resulted in excessive losses of matériel. In fact, during the main landings on Namur, the Marines could muster only 62 of the 110 alligators that had been assigned. However, the landings on both the main islands were done with expedition and efficiency. The ease of occupation was largely due to the preliminary bombardment by Navy guns, Air and Marine artillery on neighboring islands. It was demonstrated in these small island operations that prolonged preliminary bombardment could preclude a high casualty list.

On the same day that the first landings were being made on Kwajalein Atoll, American forces with far less difficulty were occupying Majuro Atoll about 265 nautical miles to the southeast. Majuro was correctly believed to be only lightly defended, if at all, and configuration of the atoll plus its location on the eastern rim of the Marshalls made it an ideal location for an advance naval base.

The Majuro Atoll contains a large lagoon about twenty-six miles long and six miles wide, which would be of value to our Navy. There were no difficulties and practically no resistance in this atoll.

The speedy capture of Kwajalein Atoll provided the Central Pacific forces with the opportunity of moving up their schedule of operations to include early capture of lightly held Eniwetok Atoll. Formal planning for this operation began no earlier than 3 February and only lasted until the 15th of that month.

The atoll lies 330 miles northwest of Kwajalein. In this atoll the three main islands are Engebi, Eniwetok and Parry. The assault troops assigned to Eniwetok were the 106th Infantry (reinforced) less the 2d Battalion, and part of the 22d Marine Regimental Combat Team. None of our units had had any realistic amphibious rehearsal. Not enough amphtracks were available. In short, the troops destined for Eniwetok were greener than most units going into actual amphibious combat for the first time.

The assault was finally established for the 17th of February, with the Marines landing on Engebi and the Army troops capturing Eniwetok Island.

At this time our mighty flotilla of fast carriers of Task Force 58 was moving westward to attack successfully the most fearsome of all Japan's island bases—Truk. This attack by our carrier planes precluded Japa-

STRATEGY

by

B. H. Liddell Hart

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nese attacks on Eniwetok Atoll during the landings.

The Japanese 1st Amphibious Brigade of 2,500 troops arrived at Eniwetok Atoll barely six weeks in advance of the first American landings and had little time to prepare proper defenses. Contrary to our expectations, most of the enemy was concentrated on Parry Island.

The Marine attack on Engebi Island resulted in the occupation of small neighboring islands during D-Day. With the artillery ashore the scheduled attack the next day was on 18 February. The naval gunfire placed on Eniwetok was considerably less than that on the other two main targets. Also the attackers were at a disadvantage because they had had no preliminary artillery bombardment to support the landings. The Japanese on Eniwetok were well dug in and efficiently handled. At noon on D-Day a counterattack was launched by 300 to 400 Japanese. The American line was held intact. This broke the enemy resistance and certain units were shifted to assist in the attack on Parry Island.

U. S. Army

Carrying men and equipment, assault boats and alligators land at low tide.

well handled. The 2d Battalion of the 22d Marine RCT overran the airfield very quickly and in six hours the island was reported secure. The naval gunfire was comparatively heavy during both the landing and the preliminary bombardment. Marine casualties seem heavy with 85 killed and missing and 521 wounded in action. In exchange, 1,276 of the enemy were killed, about half of whom were noncombatants.

A landing of the 106th Infantry on Eniwetok Island was at 0900 hours

The actual fighting time on Eniwetok lasted two and a half days and a total Japanese garrison of about 800 men were killed. Army losses of 37 killed and 94 wounded can be considered comparatively small.

The authors point out that the capture of Eniwetok Island was slower than the plans had anticipated. This was due to the relatively small amount of preparatory bombardment as compared with other islands on the atoll. In part it was due to the heavy underbrush and in part to the cleverness with which the enemy had constructed and concealed his underground entrenchments. To be fair, however, part of the delay must be laid to extreme caution of the troops of the 3d Battalion in their movement eastward.

The occupation of Parry was handled with expedition. The total casualty list on Eniwetok came to 1,096. Eniwetok Atoll was completely under American control.

It is difficult to speak adversely of any part of the Marshalls operation. It was well planned and efficiently executed. Thus, to quote Admiral Nimitz, "We get on with the war."

U. S. Army

A 37mm antitank gun, amid jungle debris, shown firing at strong Jap position.

A reading of this volume convinces me that in general the Army troops did not push their attack with the rapidity shown by the Marine units. This was not always true but was often noticeable. As a result, the Army accomplished its mission with fewer casualties. This fact must be balanced against possible naval losses such as were suffered on the fourth day at Makin.

The above criticism of the Army can be explained partly by the fact that most Army units had not been previously under fire and were becoming combat veterans under the worst possible conditions, *i.e.*, against Japanese troops in debris and jungle.

In summing up, I must point out that the authors, both veterans of the war in the Pacific, have drawn on the voluminous files of the Army, Navy and Marine Corps as well as Japanese files. They have combined text with maps, photographs, charts and tables to bring a speaking picture of amphibious warfare. In my opinion, this book will prove to be a valuable textbook and for those who enjoy reading history it will be found easy to read and worthwhile.

A
Feature Review
Exclusive with
ARMOR

PORTRAIT OF
PATTON

by

Brig. Gen.

Harry H. Semmes

This revealing book on the personal life of General George S. Patton, Jr., is the result of several years' research into the private papers of that famous combat leader. A man whose sole interest in life was the military art and whose practice of that art made him an outstanding exponent of mobile warfare. The author is well qualified to present this "portrait" of the man whom many called, "the greatest Armor commander that ever lived." The author was not only a lifelong friend of General Patton but he also served under him as an armored commander in two World Wars.

In his research, the author had access to General Patton's "personal diary" in which he noted many of his thoughts and theories on combat and leadership.

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Edited, with a preface by RICHARD HARWELL

DESTRUCTION AND RECONSTRUCTION

by Richard Taylor

Lieutenant General in the Confederate Army

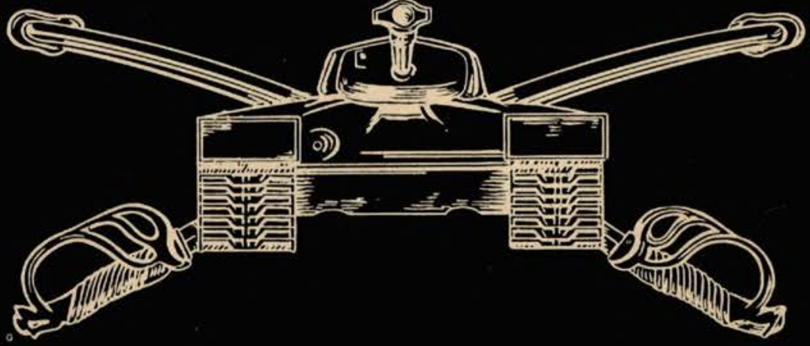
In this fascinating and important volume of Civil War reminiscences, General "Dick" Taylor tells the stories of his fighting career in Virginia with such generals as Lee and Jackson; of his part in the Trans-Mississippi campaigns, including the important and little written about Red River campaign; and of his efforts to bring peace and justice to the South during the trying years of Reconstruction. General Taylor's memoirs are remarkable for their fine account of the western campaigns and for their terse and accurate estimate of his associates during the war; his dashing and often acid style makes for lively and apt re-creation of men and situations. Grant, Lee, Stonewall Jackson, Andrew Johnson, Jefferson Davis, McClellan, Stanton, Joseph E. Johnston and a host of other leaders and their deeds are brought to life in his pages, seen through his observant eyes. And there is equal life and vividness in his description of lesser, everyday events. Originally published in 1879 and long out of print, General Taylor's memoirs are practically unobtainable. Their literary value, their importance in the Civil War field, as well as their extreme rarity make their re-publication important for Civil War enthusiasts.

380 pp. **$7.50**

To be reviewed in the March-April issue of ARMOR

by

MAJOR GENERAL U. S. GRANT III



ARMOR *The Magazine of Mobile Warfare*

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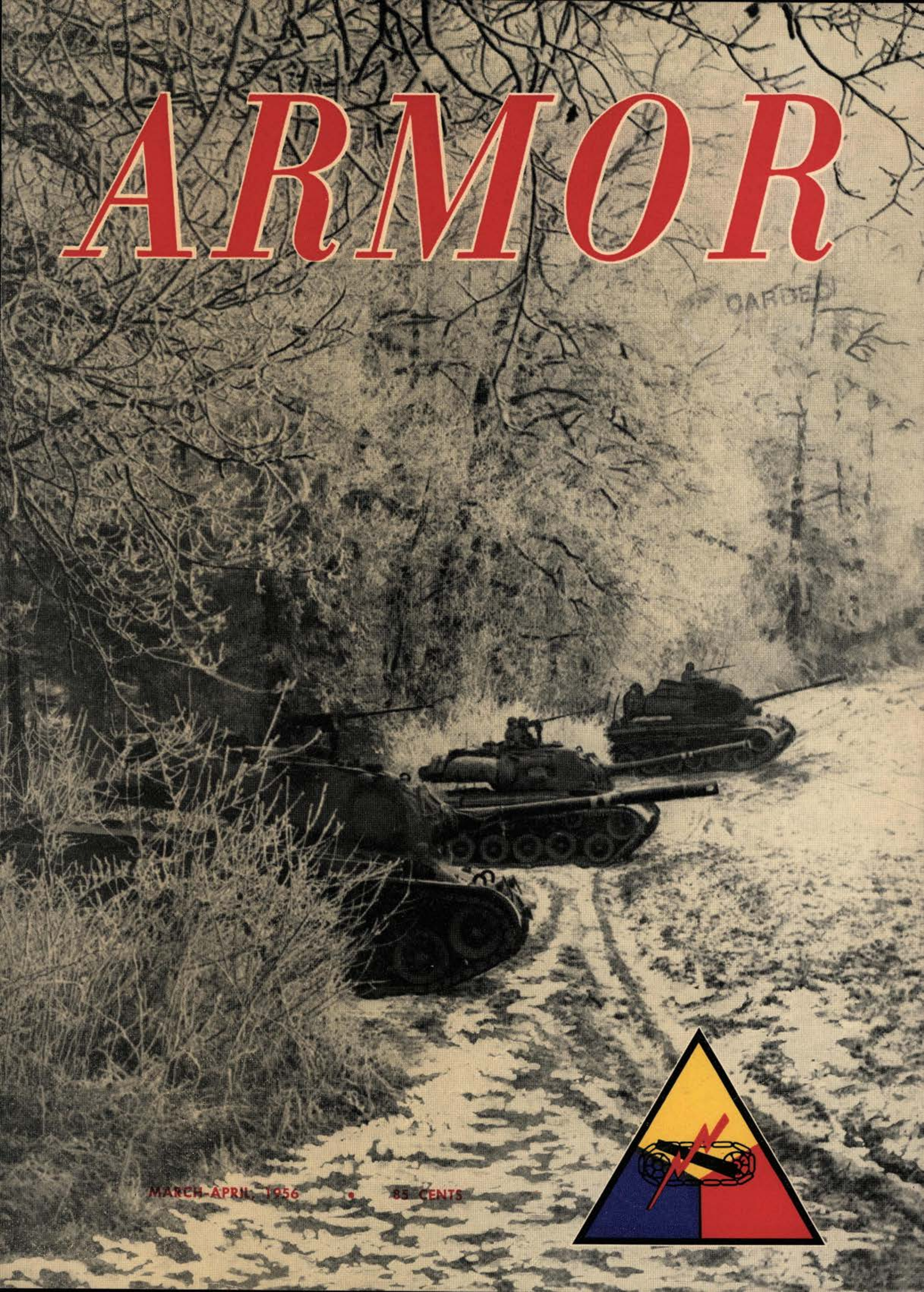

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MARCH-APRIL, 1956 • 85 CENTS

Tentative Agenda for the 67th Annual Meeting

THURSDAY 26 APRIL

0800-1200	Registration and visiting. Exhibition of new developments by Board 2, CONARC
1200-1300	Lunch
1300-1345	Innovations in combat training for reserve and armored unit personnel, ARTC
1400-1440	Career management and the Army, Gaffey Hall
1440-1500	Coffee break
1500-1545	New developments in SAGEBRUSH and BLUE BOLT, Gaffey Hall
1545-1630	Forum on Armor in the Army, Gaffey Hall
1800	Individual arrangements for dinner

FRIDAY 27 APRIL

0815-0830	Honors for general officers (active and retired), The Armored Center Headquarters
0845-0850	Introduction by Commanding General, The Armored Center, of Commanding General, Second Army, and response
0850-0900	Introduction by Commanding General, The Armored Center, of Commanding General, CONARC, and response
0900-0905	Welcome to Fort Knox and introduction of the President of The Armor Association by Commanding General, The Armored Center, Theater Number 1
0905-0915	The President of the Armor Association opens the meeting, discusses agenda, and introduces distinguished guests, who withdraw after introduction
0915	The President of the Armor Association opens the business meeting (The Armored School will conduct special presentation for non-member distinguished guests during business meeting)
1030	Coffee, Brick Club
1100	President of the Armor Association introduces the main speaker, Sadowski Field House
1110	Address by The Secretary of the Army, The Honorable Wilber M. Brucker
1200	Lunch at Country Club
1400	Field demonstration
1900	Reception and dinner for all conferees and guests
2200	Conference concluded

The United States Armor Association

Continuation of
The United States
Cavalry Association
(Established 1885)

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The Magazine of Mobile Warfare

Continuation of THE CAVALRY JOURNAL

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ARMOR magazine is published under the auspices of the United States Armor Association, and is not an official publication. Contributions appearing herein do not necessarily reflect official thought or indorsement. Articles appearing in this publication represent the personal views of the author and are published to stimulate interest in, provoke thought on, and provide an open forum for decorous discussion of military affairs.

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LETTERS TO THE EDITOR

More on 3-D Warfare

Dear Sir:

My reading is a bit behind time but today I read in *Newsweek* (November 28) where you were considering "flying tanks" as a possible development by 1970. Your creative thinking is commendable and it is only through such processes that tactical improvements are attained.

It may have previously occurred to you but I wondered if the helicopter has not reached the stage where, with only a few additional improvements, sufficient lift could be generated to accomplish the purpose you have in mind. It would appear that the fuselage and framework could be minimized to the extent that the helicopter would function similar to a tractor or a trailer truck using a cable and hitch affair. The cable could carry a cross arm that would catch in a hitch which would look somewhat similar to a claw hammer attached to the tank turret. The hitch could be designed on a hinge that could be released by the tank crew

John C. Anderson

Burlington Industries
Greensboro, North Carolina

In Support of River Crossings

Dear Sir:

The article "Rivers Are No Longer Obstacles" by Colonel Louis A. Hammack in the January-February 1956 issue clearly demonstrates the necessity for an amphibious capability in the armored infantry carrier. The importance of Colonel Hammack's imaginative solution of a river crossing cannot be overemphasized as a method of maintaining the destructive, decisive, forward momentum of armored units.

The obvious desirability of exploiting this concept raises the question of supply to the far shore—primarily a problem of gasoline. Organic division bridging would not be adequate and probably would be engaged in ferrying tanks across as a first priority. The time involved in bringing up reinforcing engineer bridge units could wipe out the advantage gained by the leading elements. The creation of defiles and the difficulty of maintaining bridges in the face of determined enemy resistance are also inherent problems of this type operation which bog down supply.

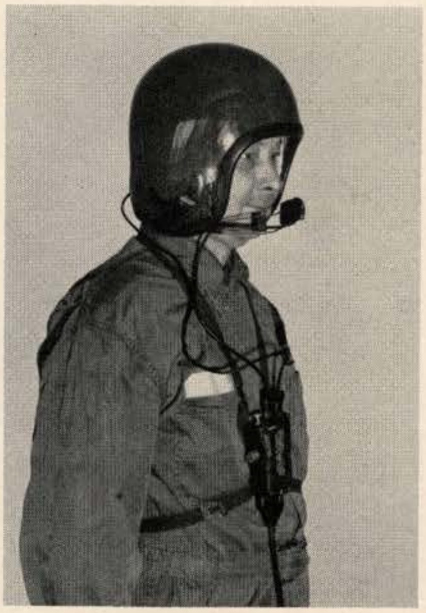
I would like to see an article published on what is being done to insure that the rate of supply can sustain the advantage to be gained by exploiting M59 capabilities in river crossings.

Captain William D. Grant

Route 1, Box 373
Valley Station, Ky.

A Field Expedient in Lieu of a Tanker's Helmet, Government Issue

Dear Sir:



Reference is made to the letter appearing in the May-June 1955 issue of *ARMOR* concerning "The New Tanker's Helmet," by Colonel Percy H. Brown, Jr., President, Board Number 2, Fort Knox, Kentucky.

We, the members of the 50th Reconnaisance Battalion, 50th Armored Division, New Jersey National Guard, read the letter with much interest.

Attached is a picture of WOJG Thomas V. Christopher, track vehicle maintenance officer of our battalion, wearing a Tank Helmet we have been using for the past 14 months in lieu of any issue type for our tankers and armored personnel carrier crewmen.

The helmet, although not as pretentious as the new helmet being developed, but workable, is one purchased from war surplus by members of our battalion for $1.50 each complete with necessary ear phones and exterior and interior wiring. It is believed to be of the Air Force type used by pilots.

The helmet, of strong nylon construction and in one piece, does not eliminate using the chest set but does provide the crewmen with a well-padded tank helmet. It also has the ear phones inside of the helmet allowing for clear reception and eliminating most of the outside noises.

It is our sincere belief that the development of a new helmet is long overdue. It is of prime importance that we cover our tank crewmen's heads with a suitable protective helmet.

Captain Arthur K. Kling, Jr.

50th Reconnaissance Battalion
NJNG, Westfield, New Jersey

Civil War Mobility

Dear Sir:

I thoroughly enjoyed the competent article, "The Cavalry Battle at Brandy Station," by Lieutenant Kennedy in the January-February 1956 issue of *ARMOR*. However, I must take issue with the closing statement, "From the end of the Gettysburg campaign until the last, sad day in April 1865 the cavalry of the Confederacy was never again the superior of the blue columns that rode against it." While it is true that the Confederate cavalry no longer enjoyed its former unchallenged superiority, there are nevertheless several notable instances between Gettysburg and Appomattox of Confederate triumphs over Union troopers.

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Rates: See bottom of contents page.

1. At the so-called "Buckland Races," October 19, 1863, Kilpatrick's Federal cavalry was drawn into a trap by "Jeb" Stuart and Fitz Lee and fled in confusion to their supporting infantry, losing 250 as prisoners.

2. At Trevilian Station, June 11-12, 1864, a numerically superior cavalry force under Sheridan was defeated by Wade Hampton, forcing the Union force to abandon its objectives and turn back to Grant's army.

3. At Samaria Church, June 24, 1864, Hampton attacked and routed Gregg, inflicting casualties over twice those of his own force. Sheridan later professed himself fortunate to have gotten off this lightly.

4. At Reams' Station, June 28, 1864, during the siege of Petersburg, Hampton drove Brigadier General James H. Wilson's mounted force to Reams' Station, where Fitz Lee was waiting. Wilson had to burn his wagons and cut his way out. The Federals lost over 1,000 as prisoners and 13 guns.

5. Hampton's brilliant "cattle raid" of September 16, 1864, netted 2,468 head of cattle for the Confederates, at the expense of the Union Army.

6. Even as late as April 6, 1865—three days before the surrender—Rosser's Confederate cavalry overcame Union troopers under Washburn, saving the "High Bridge" and capturing or dispersing the entire Union force.

It is quite true, of course, that the Federal cavalry improved significantly after the first two years of the war and that the Confederate forces suffered for lack of horses, forage and equipment. It is also true that the Union troopers bested the Confederates on a number of occasions after July 1863. However, the above examples will illustrate the fact that the Confederates won a number of handsome victories right up to the end of the war.

May I offer my thanks to Lieutenant Kennedy for a stimulating presentation and my hopes that *ARMOR* will continue to present articles of this historical nature.

1st Lt. Arthur D. Howard

Headquarters,
The Transportation School
Fort Eustis, Virginia

An Assist to the Field

Dear Sir:

Two reprint copies of the excellent article written by Capt. Richard D. True entitled: "Army Extension Courses and Your Military Education" are forwarded herewith. This article appeared in your July-August 1955 issue of *ARMOR*.

As Unit Advisor to the 187th Tank Battalion (120mm Gun), Florida National Guard, I considered this to be a timely and well-written article and worthy of reading by all Unit Officers and Enlisted Men. Therefore, it was reproduced and distributed by this office on 19 December 1955.

Major Courtney R. Shirley

Unit Advisor, 187th Tank Bn.
P.O. Box 514, Gainsville, Florida

- *Our efforts are not all in vain.*—Ed.

We Take the Blame

Dear Sir:

This letter is not meant to infer any criticism of your fine, informative, professional type magazine but unless I am badly mistaken an error has been made in the labeling of two illustrations of Soviet tanks on page twenty-two of your January-February issue.

I believe that the illustration on the right is the T34 medium tank and not the KV1 heavy tank as your caption states. The tank on the right is characterized by the Christie type suspension common to older Soviet tanks and self-propelled guns. This type of suspension is found on the T34 medium tank. FM 30-40 bears this out and provides a picture of the T34 almost identical to the illustration on the right.

The illustration on the left which you labeled the T34 is actually the successor to the T34 and forerunner of the "Stalins," namely the KV1. The suspension here again is the clue to its vintage. Since the type shown by the illustration is characterized by six double road wheels, three track support rollers, drive sprocket in rear and wide flat tracks common to the Joseph Stalin series.

Aside from this small error your January-February edition was excellent and typical of your magazine. I do not know a Marine in this organization that has anything except well warranted praise for your publication.

1st Lt. Donald E. Koelper

Marine Corps Test Unit No. 1
MCB, Camp Pendleton, California

- *You are correct and thanks for calling it to our attention. Also for the compliments.* Ed.

Attention All Members of the 1st CavDiv Association!

Dear Sir:

It was with interest that I read on page 54 of the November-December issue of *ARMOR* of the Roundup of Armored Division Associations.

Will you please include the following information in your next issue: Our President is Colonel Alfred E. Stevens. The 1956 reunion of the 1st Cavalry Division Association will be held at Denver, Colorado during 1-3 September. For further information please contact me at the address below.

Colonel Edmund P. Stone

Office of the Registrar
1st Cavalry Division Association
P.O. Box 201, Pomona, California

Attention All Members of the 2d Armored Division Assn.!

Dear Sir:

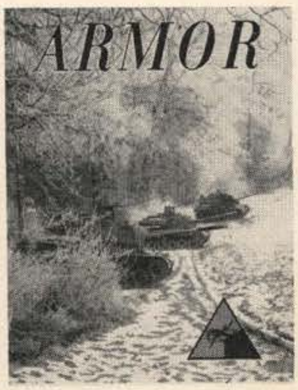
Congratulations on the spread you gave to the Armored Division Associations in the November-December issue. This information should assist all Division Associations and their members.

The 2d Armored Division Association will hold its 1956 convention at the Atlanta Biltmore Hotel, Atlanta, Georgia during the period 3-5 August 1956. Since the Division got its early start in the Fort Benning area a large turnout is expected. Among our people in the Atlanta area Lieutenant General Alven C. Gillem, Retired, has consented to lend his efforts to the successful promotion of activities.

As a matter of information our membership is approximately 5,000 strong and is steadily growing.

J. Gibson Semmes

President
2d Armored Division Association
P.O. Box 172, Alexandria, Virginia



THE COVER

This U. S. Army photograph shows members of a tank crew from the 759th Tank Battalion in defensive position near Freising, Germany, during winter training exercises. Year-round training is a must for any Army, but more especially the United States troops stationed along the Iron Curtain in Europe.

CARDED

Acme

The British Centurion is typical of the many heavy types of tanks in current use.

LIGHTER WEIGHT TANKS

By RICHARD M. OGORKIEWICZ

TWENTY-FIVE years ago a typical tank weighed about ten tons. On the eve of World War II the average weight was approaching twenty tons; by the end of the war it was over the thirty mark and today it is almost fifty, with even heavier models coming into service.

This progressive increase in weight can only be regarded with misgivings, for weight is no virtue in tanks. As it goes up, manufacturing costs and operating difficulties increase and the general usefulness of the equipment and the mobility of armored units decrease.

It is not surprising, therefore, that increasing attention has been given to this problem and to the need of reversing this trend to bigger—and not necessarily better—tanks. The attractions of lighter weight tanks are many and obvious, from reduced manpower and material requirements to the possibilities of greater strategic mobility through air transport. Most of these have received their share of attention. But not nearly enough attention has been given to the underlying causes of this trend and the implications of possible alternative courses.

The Principal Factors

The reasons for the progressive growth in weight must, in the first instance, be sought in tank armament. Technically and tactically the tank is a weapon carrier, a "vehicle to carry fire power" and its armament is and has been the principal governing factor.

It is the principal armament, its mounting and ammunition and the crew necessary to man it, which determine the size of the fighting compartment and hence the size of the vehicle. In turreted vehicles the fighting compartment means the turret and the turret ring diameter governs directly the minimum width of the vehicle and ultimately the length also, for steering considerations prescribe a fairly narrow ratio of the track length on the ground to the distance between track centers—a ratio of between 1.5 and 2 to 1.

The power and size of the principal armament have varied considerably in the past, according to the views on the general effectiveness of weapons. When tanks first appeared in World War I the relative power of machine guns was already beginning to wane but for a time tank design was largely centered on them. In fact, up to World War II machine guns were often regarded as the principal armament of tanks and designs were governed by them.

It was inevitable, however, that the size of the main armament should increase to that of the field gun. Weapons of 3 inch caliber, and more, were becoming increasingly important and necessary for the destruction of nests of resistance, enemy heavy weapons and other targets on the modern battlefield. They became, in fact, the most effective type of weapon, whether in the hands of field artillery, infantry heavy weapon units or tank crews.

In addition to the general requirements there was also the more specialized one of combating hostile armored vehicles. For a time the field gun size weapons were more powerful than was strictly necessary and

RICHARD M. OGORKIEWICZ, a frequent contributor to these pages, is with the Huber Limited, Rootes (Automotive) Group, England.

An outstanding example of a light tank design is the 14.5 ton French tank which mounts a gun comparable to that of conventional tanks almost three times its weight.

French Army

smaller caliber weapons sufficed for this role. This led to the combination of 37 to 47mm guns as anti-armor weapons, with machine guns as the chief general-purpose tank weapons, in the typical designs of the pre-World War II period.

But as the armor protection of the opposing tanks improved, the specialized antitank requirement increased and not only brought the average antitank gun up to the level of the field gun but well above the general requirements. The result is the long barrelled, high velocity guns of over 3 inches in caliber which have formed the armament of tanks from the second part of World War II to this day.

The size of tanks grew accordingly. A machine gun and a single man could be accommodated in a turret of about 30 inches in diameter; a 37 or 47mm gun with coaxial machine gun and a two man crew required a turret ring diameter of at least 50 inches; a 75mm gun and three man crew about 60 inches and today's high velocity tank guns over 70 inches.

Protection and Weight

Overall size is in itself important, particularly in relation to obstacle crossing and transportation over existing bridges, on railroads, in ships and in aircraft. It is also related to the weight of the vehicle. However, unlike many other engineering products where weight is only a function of size, the weight of the tank depends also on a second factor, partly independent of vehicle size, namely its armor envelope.

The minimum amount of armor which a vehicle carries is largely determined by structural considerations, that is, the strength of the frame on or within which the armament and other components, such as engine, transmission and suspension, are mounted. In general such armor is sufficient only against small arms and shell fragments and not against direct hits by larger caliber projectiles.

Under such conditions, exemplified by lightly armored self-propelled guns, weight is largely a matter of size and therefore of the principal armament. Increases above this minimum weight are largely a matter of armor protection which ultimately may account for as much of the total weight of the vehicle as all the other components put together.

Armor is, therefore, a very attractive field for weight reductions. At the same time, however, the protection which it still affords cannot be dismissed lightly. Were armor piercing weapons so effective that they could penetrate all armor easily then the armor could be kept to a minimum—but although they appear to be gaining the upper hand they have not done so yet in such a decisive manner as to put the issue beyond all doubt.

If armor protection cannot be lightly dismissed it can, however, be offset by armament and tactics. It is certainly true that much of the past demand for heavy armor has been the result of inadequate armament and inferior tactics; that it originated from unimaginative operational methods which asked of tanks that they should amble in front of the infantry as a kind of combination shield and steam roller. Such methods not only nullified the potential advantage of mobility but also exposed tanks to the full effectiveness of antitank fire. Had tanks been correctly regarded in the past as mobile sources of firepower, many of the designs and specifications would have been quite different. It is more than probable that were a firm step taken in the direction of optimum firepower and increased mobility tactics could be evolved in which local saturation and heavy firepower would more than make up for the passive protection of individual vehicles.

To concentrate on armament at the expense of armor would save weight and be in keeping with the primary role of the tank. The often repeated directive about arriving at a balance between armament, mobility and protection is sound in theory but in practice something has to be put first and armament is the obvious choice.

Conversely there is nothing less logical than trying to achieve economies at the expense of armament. It is a temptation to which more than one has fallen in the past but it can only be contemplated if one shuts one's eyes to one of the tank's principal requirements: the ability to fight hostile tanks. However, there are still some people who would deliberately accept this crippling handicap and who advocate that the types of tanks they favor should "avoid combat with enemy tanks!"

At the bottom of such doubtful notions seems to lie the idea that somewhere, somehow there will be plenty of scope for tanks to roam about unopposed, shooting up defenseless hostile rear troops and communications—for which light, lightly-armed tanks are all that is necessary. Such opportunities may have existed in the past, when the enemies had no tanks. But those days are past and today's potential enemies are equipped with vast numbers of combat vehicles.

By whom and how these masses of hostile tanks are to be disposed is not made clear by the advocates of the light "exploitation" tanks. But until they are, such lightly armed tanks are likely to be more of a liability than use. The first tank *vs.* tank encounter ever to take place, at Viller-Bretonneux in France, in 1918, in which a German gun tank knocked out two British machine gun tanks, showed the vulnerability of inadequately armed tanks, a lesson which has been repeated several times since.

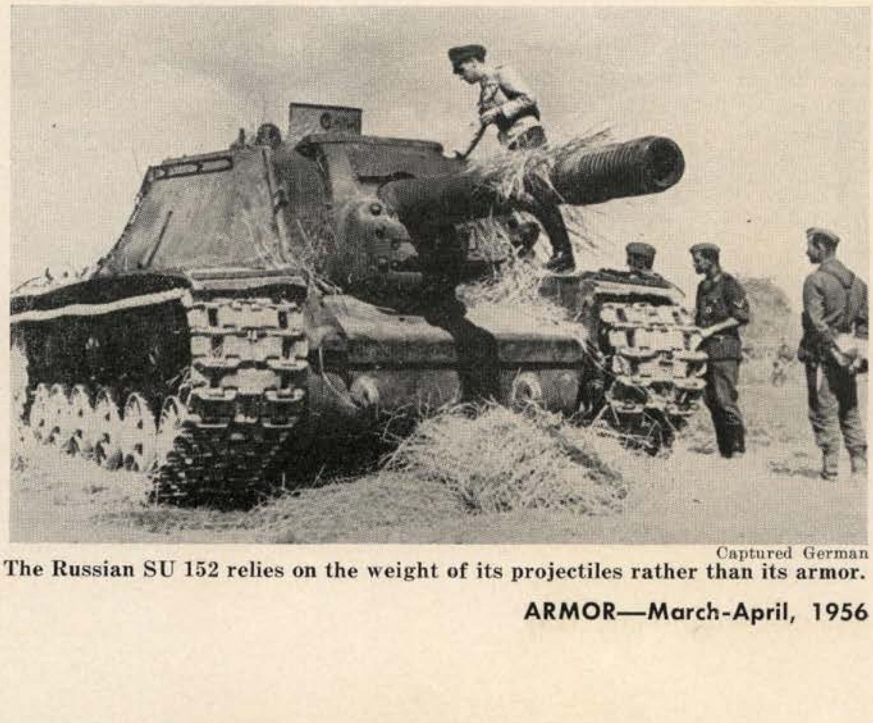
U. S. Army

The introduction of the T101 fulfills the requirement for a light, highly mobile, hard hitting, self-propelled antitank gun to support airborne operations.

Armament Requirements

The standard which is demanded today of tank armament is that it should fire projectiles capable of penetrating the armor of hostile tanks at normal battle ranges and at the same time fire a useful high explosive load for the destruction of other, unarmored targets. Currently this requirement is fulfilled by high velocity guns of 3 to 4 inch caliber which form the standard armament of the basic medium, or medium gun tanks. Their performance forms a standard below which it would be unwise to descend.

The size of fighting compartment which these guns, their ammunition and their crews demand, together with a reasonable degree of protection against their like, result in vehicles weighing between 40 and 50 tons. Lower weights are possible by accepting a lower standard of protection. This is shown clearly by a comparison of the war-time tank destroyers with the corresponding tank models or by that of the British Charioteer with the Centurion, both of which carry the same powerful gun but the former of which weighs only about one-half of the tonnage of the latter. A more radical approach would


Captured German

The Russian SU 152 relies on the weight of its projectiles rather than its armor.

U. S. Army

The M48 presents a good example of weight reduction through highly efficient saving of internal space—resulting in a crew reduction from a 5 to 4 man crew.

result not only in a reduction of armor thickness but also in a reduction of the crew and various components which together with clever detail design would lead to further reductions in the weight and size of the vehicle. A good example of this is the recent French AMX 13 light tank which mounts a gun comparable to that of "conventional" tanks almost three times its weight.

This is an attractive approach, particularly for the tank destroyer type of vehicle confined largely to defensive action and which can always make up for its armor by choice of position, if in no other way. But if a vehicle is to rely entirely on its armament under all conditions the armament must be not only good but very much better than that of corresponding conventional tank designs. So much better, in fact, that while the vehicle mounting it would itself be vulnerable it could make short work of the armor of hostile tanks.

Here difficulties begin with conventional guns since their power depends to a large extent on their size. Provided the gun is big enough it will fulfill all the requirements by the sheer weight of its projectiles, as has been shown in a rather crude form by the Soviet SU 152 with its 152mm gun howitzer. But such guns must be of at least 6 inch caliber and are in themselves heavy, their ammunition awkward to handle and they impose a heavy load on the vehicle. In general, therefore, guns of this type cannot be matched with relatively light vehicles. This approach cannot then be regarded as very promising and a departure from conventional guns becomes a necessity.

U. S. Army

The German panzerjäger reduced weight by eliminating the traverse turret.

Two divergent courses are open at present if one is to depart from the existing forms of tank armament. One is in the direction of still higher muzzle velocities and long, slender projectiles of high section density achieving their penetration by virtue of their high kinetic energy. The other is not to rely at all on kinetic energy, but, instead, on the focussed blast energy of the shaped charge projectile.

The former offers the possibility of good armor penetration with relatively small guns and, by virtue of the very high velocity, greatly improved accuracy. But the requirements of a good armor piercing projectile may conflict with those of a high explosive one, which call for large caliber.

The second approach, that of armor penetration by means of shaped charge projectiles, calls for large calibers anyway so no difficulty exists there as regards satisfactory high explosive performance. There are now several ways of firing such projectiles, from conventional rifled guns (actually the least suitable), through recoilless rifles, smoothbore "high-and-low pressure" or "throttled" guns, mortars to rocket launchers. With the exception of conventional guns all these offer the advantages of relatively light weight and are well suited, therefore, to the use in lightweight tanks.

The same cannot be said of their ammunition. Calibers of at least 4 to 5 inches are necessary and the rounds are generally not much different in weight and bulk from those of corresponding conventional tank guns. The ammunition stowage and handling problems are not, therefore, any easier.

Their other basic drawback is the fact that their flight velocities are low, high velocity being undesirable from the point of view of armor penetration and, anyway, generally not very easily obtained with this class of equipment. Their accuracy must therefore suffer. However, much can be done by improved range finding and sighting gear and it might eventually be possible to overcome this entirely by some form of guided missile. This will, of course, be a complicated way of achieving accuracy at normal combat ranges but it may well be the most efficient way of using low velocity shaped charge projectiles. It is worth noting that an antitank guided missile, the S.S. 10, is already in service with the French Army.

Ways to Save Weight

In addition to improved armament there are, of course, other ways of saving weight and reducing vehicle size, though usually at the expense of some other desirable features.

One way is the elimination of all round traverse, as had been done on the German *Sturmgeschutz* and *Panzerjäger* of World War II and the Soviet S.U.s. This, by eliminating the turret, gives a somewhat lighter, less complicated and very much lower silhouetted vehicle. But the absence of all round traverse unquestionably reduces the overall effectiveness of the vehicle, particularly in offensive roles.

Another way is by reduced stowage and ammunition requirements. This is one of the ways in which the Russians managed to mount the 122mm gun within the relatively modest dimensions of the Stalin tank. However, having less than half the customary number of rounds is a handicap, even though a lesser one in a heavy tank than in a medium.

Yet another way is to reduce the size of the crew. Over the past few years there has been a general trend away from the customary five man crews to four—as shown by the Stalin, Centurion and the M48—with no ill effects on combat efficiency and appreciable saving in internal space requirements. The French, in their AMX 13, have gone a step further to a three man crew and it is quite conceivable that with the development of a reliable automatic loading mechanism the crew could be reduced still further, to two men: a driver and a gunner/commander.

This, of course, was the crew of all the early light tanks, from the Renault F.T. of World War I to the light tanks of the thirties. It worked reasonably well when the main armament consisted of a single machine gun and the role of tank was limited; it worked less well later, when the armament was increased, as on French tanks for instance. In 1940 the one man turrets of all French tanks were considered a serious tactical handicap because it was discovered that under modern combat conditions the gunner/commander had too much to do. The question of sufficient freedom for the tank commander to exercise tactical skill cannot, therefore, be overlooked. Otherwise, if he doubles in the roles of commander and gunner, he may well remain preoccupied with gunnery or rocketry.

It would be unrealistic to expect any dramatic changes in the specific size and weight of the principal mechanical components, such as engines, transmissions, suspensions, and so on. Specific size and weight are, of course, being improved by continuous engineering development and better materials. But this is a necessarily slow process and any major reductions in the size of these units can only come from the reduction in weight of the vehicle itself. In other words, the smaller and lighter the vehicle the smaller will be the mechanical components and the lower still the total weight of the vehicle.

Much the same comments apply to the fuel capacity requirements which for a given standard of performance and operating radius depend largely on the weight of the vehicle. As it is, there is no capacity to spare as the operating radius of present day tanks is by no means outstanding and a reduction in the amount of fuel carried would not be acceptable to the armored units any more than any drastic reductions in the amount of ammunition carried. If tanks are to exploit their mobility they must possess a certain minimum degree of independence on the battlefield and cannot be constantly refuelled and resupplied with ammunition.

As regards the amount of fuel carried, some saving could, of course, be achieved by using a more efficient type of power unit than the present type of gasoline engine. A diesel for instance, supercharged to make it also competitive on a power to bulk basis. The resulting increased economy and reduced fuel requirements would be desirable from several points of view and especially on account of the increasing vulnerability of supply lines. For the same reason devices which increase fuel consumption should be guarded against. This applies to such things as some of the current torque convertor transmissions which waste vast quantities of energy and fuel, however good they are in other respects.

It has been suggested more than once that gas turbine power units could make a substantial contribution to tank design: they may do so eventually but the immediate prospects are not encouraging. Gas turbine engines can certainly develop large powers from relatively small size units but, unfortunately, at the expense of fuel economy. Efforts in the direction of improved fuel economy have so far invariably resulted in greatly increased bulk so that the gas turbine is no better on a power to engine size basis than a conventional piston engine, apart from being more expensive.

Explored to their utmost, design improvements could undoubtedly contribute to reducing the weight and size of armored combat vehicles. But any improvements thus obtained would still be small by comparison with those which would result from:

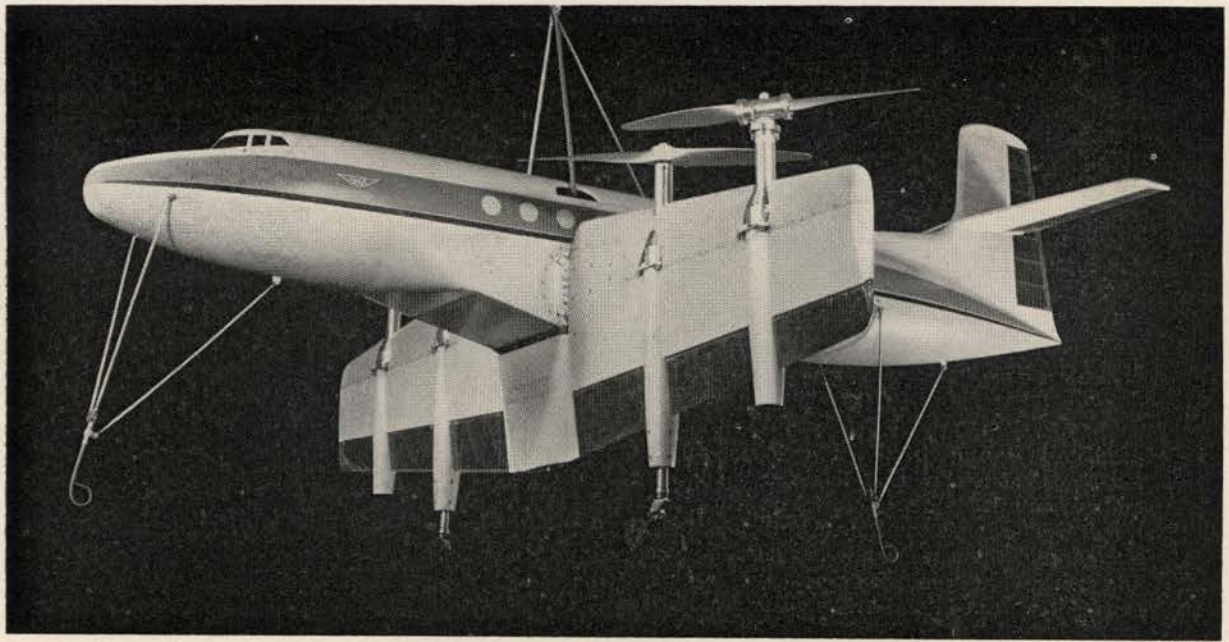
1. development and adoption of lightweight main armament
2. reduction in the thickness of armor.

The development of a really powerful lightweight tank armament would be the most direct and certain way of reducing the size and weight requirements of tanks. It would also reduce qualms about reducing the thickness of armor and thus would make a further substantial contribution to weight reduction.

It is in the evolution of such light weight tank armament, therefore, that the crux of the whole matter lies. On it and the evolution of new tactics —away, once and for all, from the "mobile fortress" ideas—depends much of the future of tanks. Their development is more than desirable as the alternative seems to be a continuing tendency to elephantitis and a possible extinction of the species.

CARDED

FANTASTIC FEATURES OF FUTURE WARFARE



NACA

The VTO transport has upward-pointed wings and propellers to produce lift for take-off, hovering and landing.

By LIEUTENANT COLONEL ROBERT B. RIGG

THE atomic age is producing a curious military end-product, yet only a few persons are conscious of its birth and beginnings. This military end-product is not a by-product because it will serve not only to alter the form of any probable future conflict, but it could eliminate atomic war itself. This end-product is a new form of lightning war: 3-Dimensional blitzkrieg.

While the world will stand in living dread of atomic warfare, and nations will continue to gird for its possibilities, this new form of blitzkrieg will quietly undergo development and progress. The fantastic proportion of future warfare is barely visible now because much public attention is focused on atomic weapons.

Since the inception of armed conflict, man has sought increased destructive effect. The peak in potential military destruction has been reached. Man now possesses more blast power than he needs. The world is on the brink of full realization that a total duel with atomic weapons is simply execution of a mutual suicide pact. The horror of this grim possibility provides the foundation upon which men will seek new approaches to a more sanitary[1] form of warfare and defense. Thus we are entering a new era, that of *3-D blitzkrieg,* wherein multiple forms of military mobility will introduce fantastic features into future war.

This multiple approach blitzkrieg will become the core of 3-Dimensional warfare, that form of future conflict utilizing flying tanks, leaping logistical carriers and flying pillboxes.

The Fantastic Vehicles Are Here

Since the 3-D warfare concept was published in ARMOR (November-December, 1955), the following five realities have either taken place or have recently come to public notice:

First, the Army has purchased 12 experimental models of the *Aerocycle,* a one-man flying machine designed to give the infantryman more mobility than he has ever possessed.

The second reality is the *Flying Crane,* the Air Force's XH17 helicopter that has actually lifted a 7,800 pound trailer van. The Flying Crane is now lifting a weight one half that of the Army's new self-propelled gun, the T101. Thus, one existing helicopter is approaching the lift capacity of

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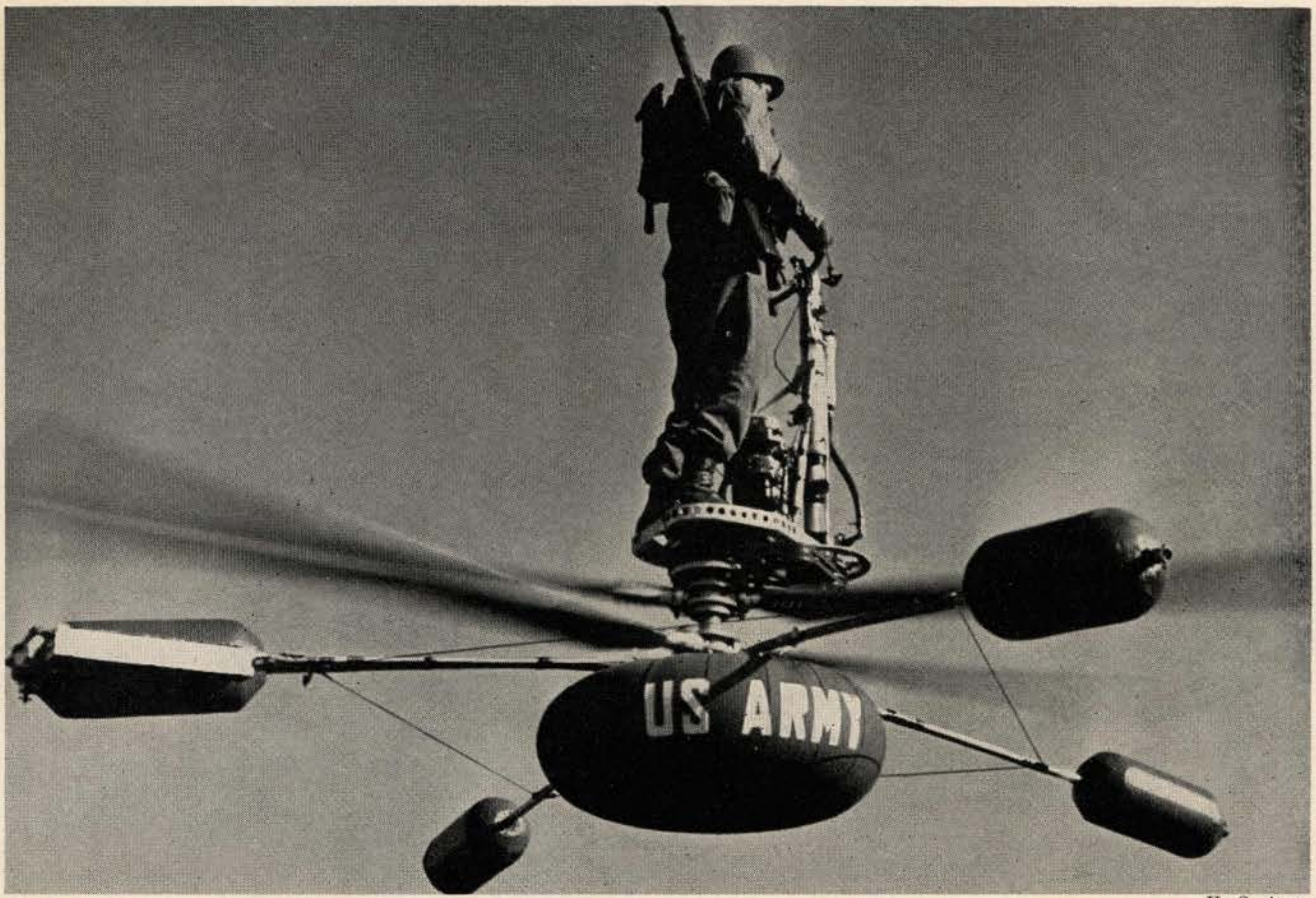
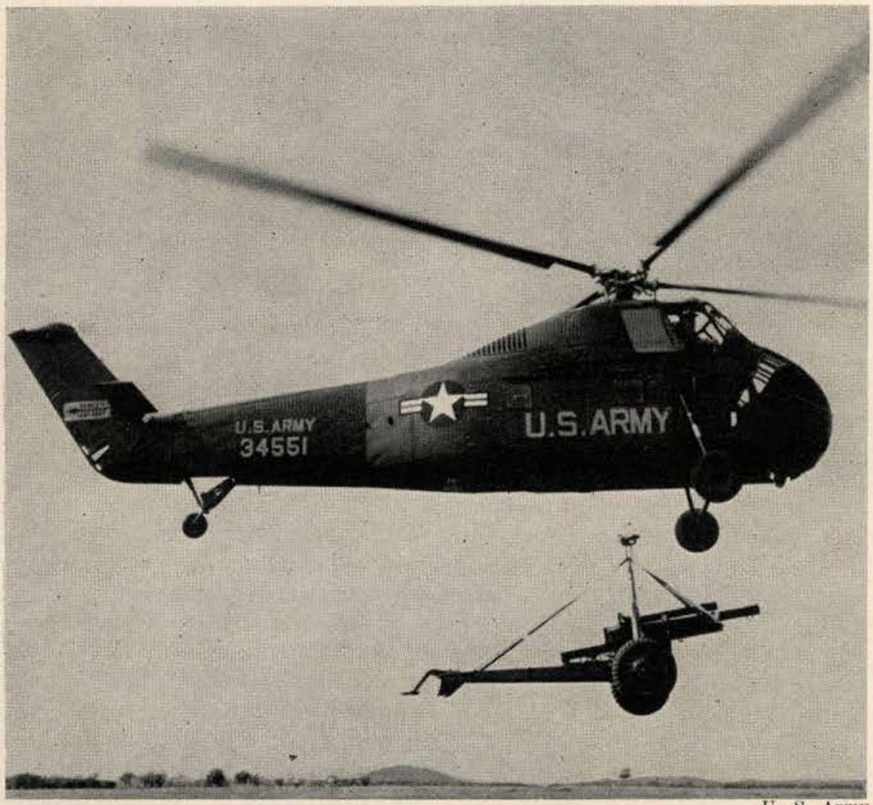
[1] Sanitary is here defined as clearer cut warfare between military forces. This does not eliminate the necessity for reducing strategic targets.



U. S. Army

The Aerocycle is a one-man flying machine designed to give the infantryman more mobility than he has ever had.



U. S. Army

The Flying Crane—XH17 helicopter has actually lifted a 7,800 lb. trailer van.

transporting a 90mm gun and tank-tracked carriage. In five years the marriage of tank and helicopter, even in this crude form, can be such that 15 crane-helicopters can lift a tank battalion across a river in one morning and resupply them in the afternoon. The Army's M59 armored personnel carrier for infantry is already capable of swimming rivers. Bridges are nice, but in hard combat they are bound to be eliminated for faster tactical means to the end: get across in a hurry and save lives.

Another reality in test model form is the *Aerodyne* invented by Dr. Alexander M. Lippisch. All fuselage and no wings, the Aerodyne gets its lift from a blast of air blown through its belly. Dr. Lippisch's experiment is of such significance that the Office of Naval Research is subsidizing his research. Dr. Lippisch hopes to have a piloted Aerodyne flying within this year.

The fourth reality is the *Flying Barrel* or ring-wing-type aircraft. The Navy has awarded a research contract to the Kaman Aircraft Corporation for the development of this annular wing aircraft that will combine the advantages of the airplane and helicopter for vertical and horizontal flight. The French Government has financed work on the *Coleopter,* a flying barrel which is being developed by Dr. Helmut von Zborowski, a German engineer and aircraft power-plant specialist. The Coleopter (from the Greek for "sheathed-winged") has been put through laboratory and wind tunnel tests. A full sized flying barrel is expected to be evident soon in France.

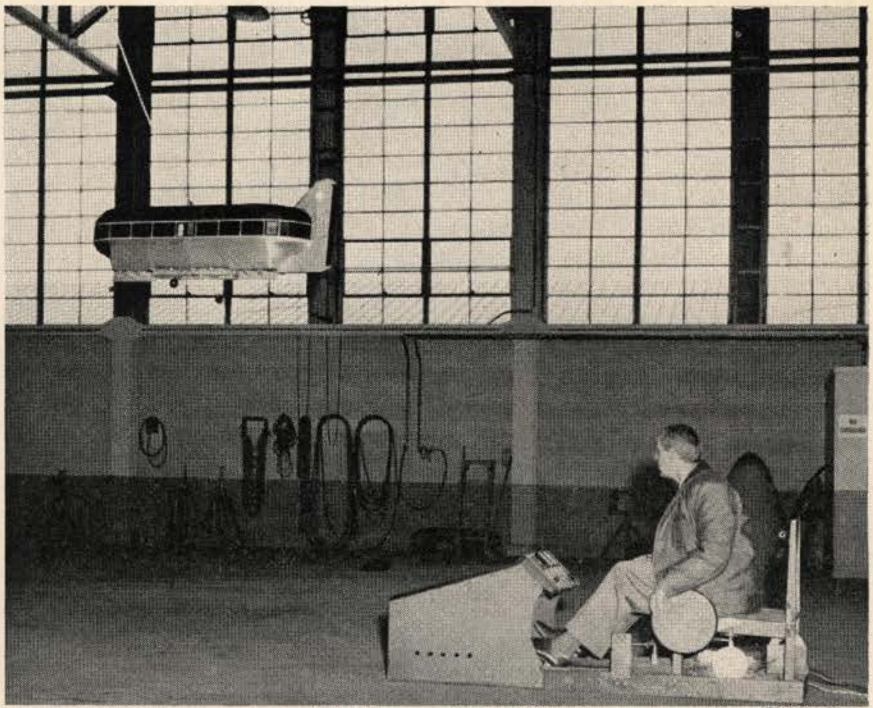
In the field of larger aircraft with vertical landing potentialities there is the fifth reality: the Army's *Convertaplane.* In addition, there is under development the vertical take-off and landings airliner. (*The VTO, hereafter referred to as VETOs.*) This plane itself has been successfully flown at Moffett Field, California.

Thus there is in being today an array of functional aircraft or devices which provide the very foundation for 3-Dimensional warfare and 3-D blitzkrieg. The way is clear, to wage future combat without complete reliance on roads, big airfields and bridges. Project by eight years the vertical take-off ships, or VETOS, which we now have and this new form of warfare will assume such concrete shape that even the logisticians will be convinced that 3-D combat is here to stay. Actually, this revolution in tactics and techniques is going to cause a revolution in military logistics as well. The problem is to leapfrog certain logistical concepts and practices over to a new field of military art that will be in key with the future forms of mobility.

In the field of prediction, the ranges are unknown and the targets are obscure. This article is not to record a set of predictions, but to outline possibilities that lie within the grasp of the Army. These are the possibilities. They can be accepted or rejected—but they cannot be ignored.

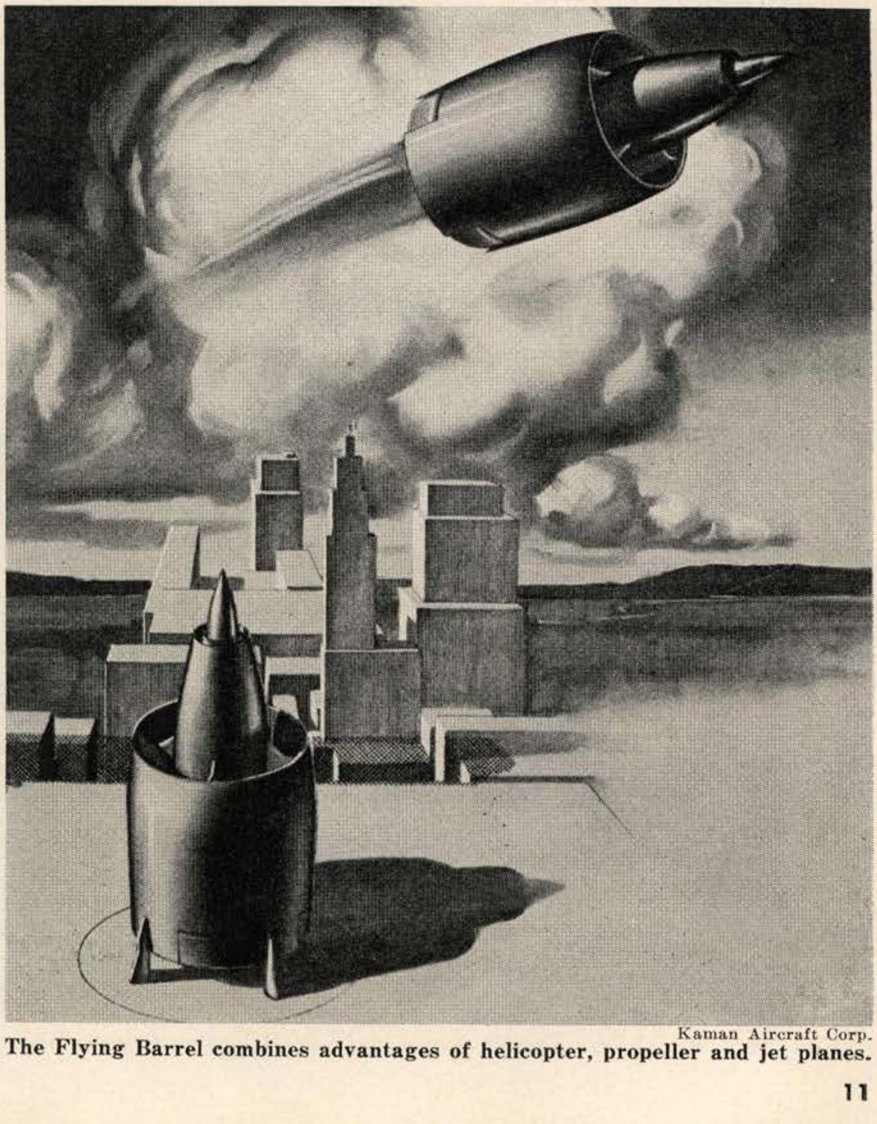
3-Dimensional Blitzkrieg

The flying tank will project armor in a new form of mobility that will give combat a fantastic final proportion. It is too early to predict the form of the flying tank. Its form was suggested in my last article. However, the more probable design will be that



U. S. Navy

The Aerodyne, all fuselage and no wings, gets lift from blast of air through belly.



Kaman Aircraft Corp.

The Flying Barrel combines advantages of helicopter, propeller and jet planes.

of the WASP, which is a flying barrel with tracks. The hull and the turret will be one unit, the barrel itself rotating on the track platform as shown.

Battalions of these barrel WASPs will constitute 3-D task forces that can alight in enemy rear areas to destroy the logistical support installations of large forces. Then in turn they may take off to engage in combat in other chosen areas. By their mobility they will force such fluidity into combat that they can only be countered by tanks of similar function.

The 3-D blitzkrieg capacity of 470 flying tanks alone is such that this force, organized in seven columns, can militarily and momentarily (one to two days) dominate an area the size of Austria and wreak destructive havoc on conventional enemy forces of up to 40,000 troops. Add 10,500 VETO lifted infantry (21 battalions of 500 each) to the 470 tanks and *this* blitzkrieg force can successfully dominate a region like Austria for one week and defeat a conventional aggressor force of up to 100,000 men. These combat proportions appear fantastic on the surface until one grasps the mobility aspect of VETO tanks and infantry which can engage, disengage, disappear and reenter combat at will almost without particular reference to the limiting influences of terrain. The biggest advantage of the VETO forces would be the surprise factor. This tactical advantage would serve to reduce ammunition consumption and thereby reduce logistical tonnages of supply and resupply. Furthermore, the capacity of VETO units to disengage in combat quickly and decisively means that they can return to several rendezvous of supply and thereby largely eliminate the present practice of shoving all supply tonnages forward. To the combat unit stuck on the front, 3-D combat will eliminate fronts entirely. There will be only points and areas of combat and conflict. These points will be multiple; they will be grim and decisive.

The nation first developing the capacity for effective 3-Dimensional combat will assume unusual international dominance. This dominance has two edges. In aggressive hands it can be a dire threat to small nations. In the grasp of the Free Nations it can be one of the greatest war deterrents of the atomic age.

If two sides possess the same 3-Dimensional capability in conflict the question arises: Do the flying tanks start shooting down other airborne tanks and VETO personnel carriers so that the new warfare becomes air-to-air? The answer is that equality in 3-D warfare will breed a fantastic set of air-to-ground tactics in which the earth itself would assume new defensive advantage. Air-to-air combat between flying tanks and other VETOs would evolve, but it would be minor in scope, because the VETOs are primarily ground vehicles. Would new missiles eliminate flying tanks and other VETOs? Certainly missiles could shoot down individual flying tanks, but armor is employed in mass formations. To successfully oppose massed tanks with missiles will require massed missiles. Then the question would be: is the mobility of missile units and installations comparable to that of the versatile armor? Probably not! As for VETO infantry, it would be capable of dispersal on ground to where it would not be profitable to employ expensive missiles against infantry.

The significant fact is that VETO Armor and Infantry can capture the enemy as well as shoot and destroy him. The guided missile or rocket can capture nothing. The former constitute the forces of 3-D blitzkrieg, while missiles simply remain artillery which can be used offensively and defensively in support of mobile forces.

3-D blitzkrieg will reduce combat to its purest form, that of military forces seeking to destroy opposing forces. It will feature rapid raids and

US ARMY
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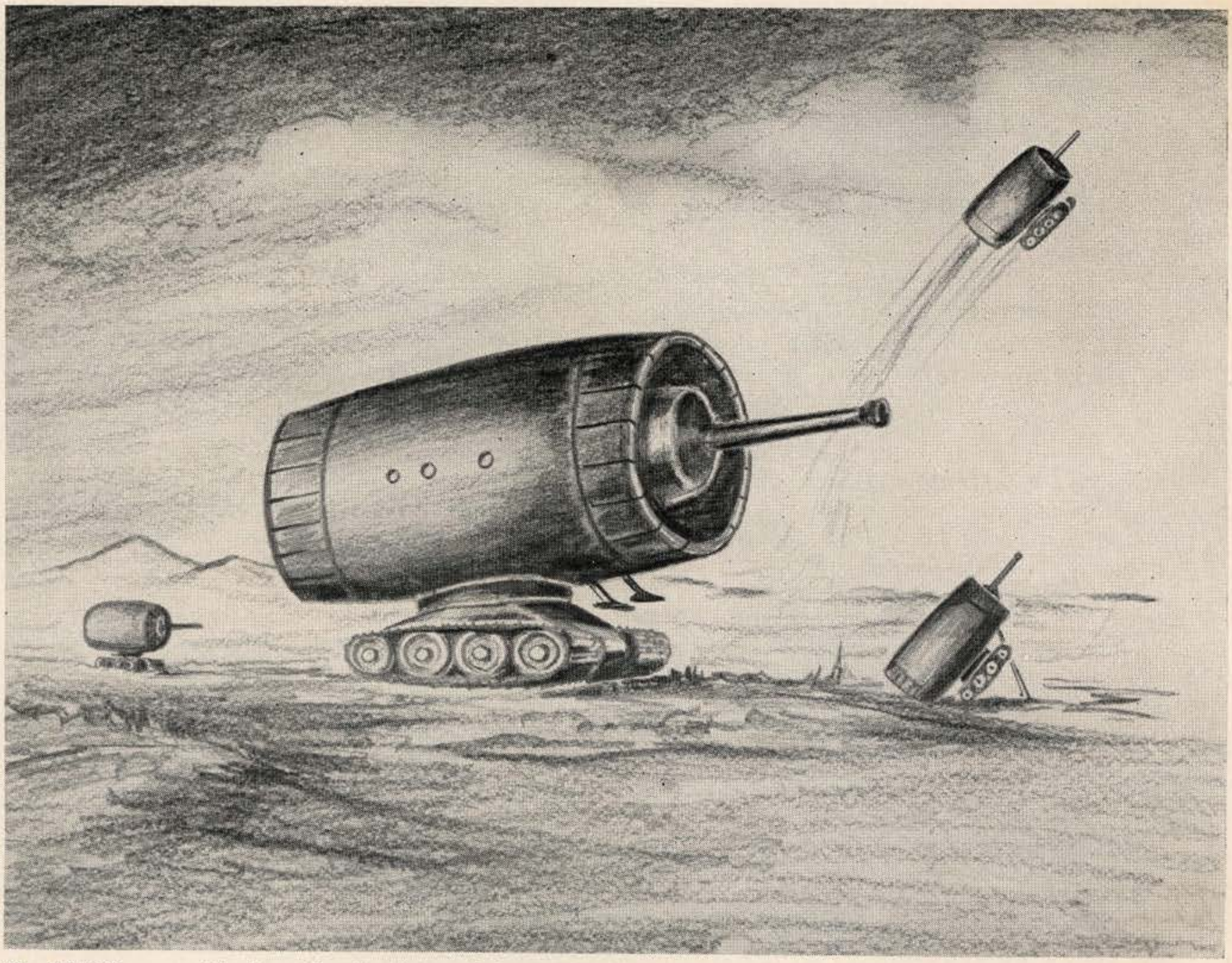
BELL Aircraft XV-3

Bell Aircraft Corp.

In the field of larger aircraft possessing vertical landing potentialities there is the Army's Convertaplane.



The WASP, a possible form for the future flying tank. The turret and hull become one unit enclosed in the flying barrel which on the ground rotates on the track platform. Elevating arms place tank upright for vertical take-off.

destructive strikes on a principle of straight line approaches, and only when VETO forces land will terrain have influence on the conflict. The influence of terrain will be local.

3-D blitzkrieg means reach, destroy and seize. 3-D strikes can be so sudden that seizure may in many instances supplant the need for destruction, because the surrender of surprised forces may be the first result of a bold strike attack.

Logic in Logistics

The slow processes of conflict cause rise in consumption of military supplies. The more rapid the striking power, the more militarily effective it is. Thus, blitzkrieg serves to gain more decisive effect from a given tonnage of ammunition and fuel than do the less mobile forms of combat. Furthermore, the problem is not just one of matériel consumption and weight—it is one of lives. Vertical lightning war would save lives because of its sudden decisiveness.

The logistician can argue that if new machines are created, tonnages and consumption of fuel will rise. This could be true for the period of use of the new machines. However, while the daily cost and consumption may be greater, new mobility for men and machines can serve to shorten conflicts. The result will be that the final cost in men and matériel is less.

Blitzkrieg or Atomic Conflict?

The peak in potential destructive power has been readied. In place of being an intoxicant, this mutual destructive power is likely to achieve a sobering effect within aggressor circles. Stand off, or nuclear parity, has been reached. The consequence is that while large nations will retain their atomic capabilities—and while the potentialities of aggression and massive defensive retaliation will remain—the indicated result is that other forms of warfare will be sought or applied by aggressive powers.

It remains for the Free Nations to develop full capability to deter war or thwart a new type of aggression—that of 3-D blitzkrieg. This can only be done if we advance our own mobility into sophisticated forms that have certainty of deterring conflict—or winning it quickly. Any future conventional conflict, if it reaches a prolonged stage, runs into danger of precipitating more awesome and destructive war. We require a new form and a better form of combat strength to avoid this danger. Its beginnings are already to be found in the United States Army where its effect as a deterrent force will be more appreciated with the passage of time.

CARDED

Logistics in 3-Dimensional Warfare

By COLONEL WILLIAM C. HALL

A STIMULATING and imaginative article, "3-Dimensional Warfare," appeared in the November-December 1955 issue of *ARMOR*. The author gave a fascinating picture of warfare in the future, stating that "by 1970 it is possible to achieve a revolution in ground warfare that will reduce the influence of terrain on combat by approximately 70%." He proposes the use of flying tanks, individual helicopters, flying platform logistic and personnel carriers and airborne rocket artillery; concentrating and striking rapidly, this force will leap over rivers, roads, minefields—making roads, bridges and airfields unnecessary in combat areas.

The author covered logistic implications in two short paragraphs. He proposes supply by use of flying pallets of prepackaged supplies, noting that "depots will disperse upon vertical landing over a wide area to allow take-off and service dispersed tactical units" by "aircraft capable of vertical take-off and landing." "There will be no single loads for fuel" but packaging containing the essentials of Class I, III and V.

The ideas presented in this article have sufficient value to merit serious study. I believe that as a basis for study we can accept, in general, the tactical concept presented. However, the logistic implications require considerable additional development. I am reminded of a statement made by the late General "Hap" Arnold, during the last war, that air power rested on a tripod consisting of planes, trained crews and ground support. If any of these failed (and on this occasion he was referring to ground support), air power would cease to exist. Logistics defeated Rommel in North Africa and stopped Patton cold on the Moselle. The wheels of warfare will grind to a halt under any concept—past, present or future—without adequate logistic support.

The rapid and dramatic increase in destructive power in atomic weapons is impressive but it should not lead us to expect equal results in other fields of research. The principles of atomic fission were known 25 years ago and predictions were made that long ago of its ultimate availability. Atomic power for vehicle propulsion will come but there are problems of weight and radiation which may take longer than 15 years to solve for combat vehicles. The author speaks of new metals. I believe that present research is looking toward a modest 20-40% reduction in weight of weapons and vehicles. As Lt. Col. Rigg states, "jet power can be harnessed" but it is known to be very inefficient at low altitudes. We should anticipate considerable but not revolutionary improvements in weight and vehicle power.

The rapid development of antitank weapons leads me to doubt that there will be tanks, as we know them, on the battlefield of 1970. I agree with the author that there may well be flying artillery by 1970. A flying control center could keep missiles orbiting around it until released to a flying OP for delivery.

There may well be some form of flying personnel carrier using the platform or "flying bedstead" principle. Such a vehicle—flat and round—would look like a "flying saucer." This term is so firmly planted in the American mind that its adoption is natural, and any other term for these vehicles probably would not be accepted. Remember the Army's efforts to change the name of the jeep, and Secretary of Defense Louis Johnson's attempt to change the name of the Pentagon. If you can't lick 'em, join 'em! Regardless of its name, this vehicle as described in "3-Dimensional Warfare" would have a high silhouette, carry considerable excess weight on the ground and be a clumsy compromise.

The jeep and the weasel were important battlefield vehicles in World War II. The jeep had serious limitations in cross-country use; the weasel had a poor power plant and could not operate in slippery mixtures of soil and water. Maintenance of the jeep did not present a difficult problem; that of the weasel did. We could with comparative ease develop a vehicle with the best features of the jeep and the weasel. For discussion, let's call this a "jeasel." This will not be a flying vehicle but will fit under the fuselage of a flying carrier or "mother jeasel." In its ground mission, the jeasel would be much more efficient than a vehicle carrying a power plant and other paraphernalia for flying. The hard-to-maintain flying equipment could be kept well in the rear until required.

The author of "3-Dimensional Warfare" considered only attack in the forward area. Even with inferior mobility the enemy would strike at our rear. Some defense is required. Our flying striking force must be considered the spearhead of the Army. More conventional and less expensive forces must follow up and exploit success of the flying elements.

The objective of 3-dimensional warfare is stated by the author. "Warfare will assume pure form, *i.e.,* destruction of opposing forces will be the prime objective. Regional cities and terrain will lose their present importance, and the logistic objective of fuel, food and ammunition installations and stocks will take their place. Strategically, of course, national industry will remain the ultimate objective."

In an all-out war, atomic weapons may reduce whole nations to useless, indescribable ruins. In the unlikely event of atomic stalemate the objective will remain the destruction of the fighting capability of opposing forces.

The objective of the striking forces stated in the previous paragraph is to cripple the combat elements engaged.

Let us consider the forward zone corresponding to the present Army area. This would be a zone 50 to 100 miles in depth.

The army commander would be responsible for the offensive strikes of his atomic spearheads, consolidation of gains, defense of his own installations and for screening the forces in rear of him against attack.

The army installations will include bivouacs for striking forces, command and communications facilities for headquarters and the logistic setup.

The striking forces would furnish their own protection. The command and communications elements could be located with other organizations. The logistic installations will give us problems. Protection is required not only from atomic weapons similar to those of our striking forces but also against infiltration by small groups.

Let us assume an Army of three groups and nine divisions. Each division would have three spearheads and each echelon would have reserves making, say, 15 striking forces in all. A spearhead would be a balanced force averaging 50 small helicopters, 50 flying saucers, 100 jeasels and 3000 men. This would total 750 helicopters, 750 saucers, 1500 jeasels and 45,000 men for the striking force. Additional forces, less elaborately equipped, would be required for occupation of captured terrain.

The supply of this force in action would require a new concept. Ammunition, fuel and food could be delivered by air as indicated by Lt. Col. Rigg. Maintenance would be carried on in the rear areas and will be discussed later.

Combat support will include prevention of infiltration as well as defense against conventional ground, air and airborne attacks. Troops with the primary responsibility for defense in the Army area would be needed. These forces would have proportionately fewer helicopters and saucers but more jeasels.

Our logistic personnel would have a few helicopters and saucers, but many jeasels. Command and administration would take more vehicles. It does not appear unreasonable to assume a total of 2000 helicopters, 2000 saucers and 12,000 jeasels (as well as heavy trucks and special vehicles).

In 1950 it required 10 hours maintenance for each hour of flying for a light helicopter. This figure has been reduced to about 5 to 1. Improvements will be made but even with our light planes, which are simple proven machines, the ratio is above 1 to 1. Additional complications in design will result in increased maintenance problems counter-balancing improvements in design and maintenance practices. If we assume ratios of 3 to 1, 10 to 1 and 1 to 1 for helicopters, saucers and jeasels respectively, the total requirement for maintenance totals some 40,000 man-hours per hour of use. For an average use of two hours per day, it would require a crew of 10,000 mechanics. Supply, administration and transportation personnel would more than double this figure. Setting up, maintaining and protecting these dispersed detachments would be a tremendous job. Evacuation of flying vehicles and transportation of mechanics, maintenance equipment and spare parts become major problems. It is apparent that the Army support will be substantially increased and that back-up in oversea and U. S. areas may be greater than anything we have seen up to this time.

From another viewpoint, our current availability, *i.e.*, ready to fly status of light helicopters, is about 50% and for light planes about 65%. These figures may be improved somewhat but if we consider that the truck is a standardized, sturdy vehicle and the availability of trucks in this country is currently less than 75%, we can see that somewhere on the ground in 1970, there will be a large number of non-operable flying equipment. The supply, maintenance and replacement problems will still be with us.

Unless this force is in being in the theater at the time war breaks out it would be a tremendous task, and one greater than any seriously studied to date, to transport such a complicated and elaborate fighting organization overseas.

We can support a striking force completely air-transported, but the logistic problem will be greatly increased. Unless sound logistic study keeps pace with weapons development we will end up with a one-shot force incapable of sustained operation. Maybe, as Lt. Col. Rigg states, a properly designed 3-dimensional force can engage seven times its number, but it will have to hit and keep hitting to be effective. Like an iceberg, four-fifths of our total striking effort may not appear on the surface in the Army of the future. We must never forget this fact.

COLONEL WILLIAM C. HALL, Corps of Engineers, graduated from USMA in 1931. During World War II he served in Europe commanding an Engineer Combat Group. Subsequently he held several Stateside assignments. Next he commanded an engineer topographic unit in the South Pacific and Alaska. Then he was assigned as Army Engineer and G4, Second Army. Presently he is attending the National War College, Fort McNair, Washington, D. C.

Reiterating Our Position

In the Spring of 1953, when the editorship of ARMOR was entrusted to the hands of this incumbent, we editorially reiterated the position of the United States Armor Association in the professional military field. As an adjunct to training, it was felt that there was a definite need for this journal ARMOR—the product of the United States Armor Association. To stimulate thought among our members, and as a medium to exchange views and professional information, it was then felt that ARMOR, as such, was a necessity for Armored personnel and Armored units of both the Regular establishment and the Reserve components in carrying out their respective missions.

At the same time an over-all, Army-wide organization was advocated to operate in the general area *above* and outside the existing organizations. This was spelled out editorially in the May-June 1953 issue of ARMOR.

At a council meeting of the Association, held in the Spring of that same year, a resolution was adopted advocating these beliefs and the need for an Association representing the entire Army. This resolution was circulated to other combat arms and service Associations and is reprinted here as it appeared in the September-October 1953 issue of ARMOR.

* * *

RESOLUTION

"WHEREAS the modern ground army is a carefully balanced force of many combat arms and technical services, and

"WHEREAS cooperation and teamwork among the many combat arms and technical services form the basis for battlefield success, and

"WHEREAS for many years the professional military associations of the respective combat arms and technical services have through the promotion of branch understanding, contributed substantially to the effectiveness of the Army Team, and

"WHEREAS there exists no professional military association with periodical in which all members of the combat arms and technical services may meet on a common ground

"NOW, THEREFORE, BE IT RESOLVED, that the United States Armor Association propose consideration of the formation of an Army-wide military association to operate in the general area outside of existing branch associations, with membership to be open to all military personnel, irrespective of branch, rank, or existing affiliation, and

"BE IT FURTHER RESOLVED that the proposed Association be organized, not to replace any of the existing branch associations, but to supplement them instead and thus contribute to further unification within the Army, and

"BE IT FURTHER RESOLVED that the proposed Association be in addition to and separate from the existing branch associations, representing the over-all Army view and dedicated to the interests of our country's defense."

* * *

Since that time Armor has grown in stature within the Army. Hence, it is believed that there is an increased requirement to publish *ARMOR* to assist personnel stationed around the world who are interested in providing our Army with the maximum mobility. Concurrently, it is felt that there is a growing need for an over-all Army Association representing all the combat arms, and technical and administrative services, to tell the United States Army story to the American people. It is believed that this Association should include sponsorship by civilians interested in the Army. Their efforts should present the Army *to* the public-at-large *for* a better understanding of the role of the ground forces, whether in peace or in war.

A journal published to accomplish this purpose could hardly contain the type of information needed by the professional commissioned officers and noncommissioned officers in their efforts to perform their mission in any particular field. Thus, there is an understandable requirement for the continuation of *ARMOR, The Infantry School Quarterly, Ordnance, The Military Review, The Quartermaster Review* and other technical and administrative journals.

It is our suggestion that the Army should consider setting up an over-all Army Association which would publish a journal presenting the views and activities of the Army to the American people. It is possible that the civilian aides to the Secretary of the Army and members of the country-wide Armed Forces Advisory Groups, who have had Army service and associations, might be approached to study these suggestions. Such an over-all Army Association might then be supported by all existing organizations which are interested in the Army. Its journal might well contain material prepared for public consumption rather than technical data concerned with particular fields of endeavor. It should represent the entire Army. To tell the story, this over-all Army Association should represent every facet of the ground forces, including combat arms, technical and supply services, civilian advisors, historical groups, the various branch and division associations and all components of the Regular Army, National Guard and Reserve.

In September 1955, our eminent Chief of Staff, General Maxwell D. Taylor, wrote to his top officers inviting them to assist in presenting "the Army to the public in its authentic light." Later he contacted many retired officers, informing them of some of the Army's vital problems. By informing them of the latest concepts he concluded, "I hope, however, that (these) points will be of some assistance to you in serving as an active spokesman for the Army in your community, helping you to explain the roles and missions of the Army to the public which needs to understand them." We subscribe to these thoughts wholeheartedly.

The United States Armor Association again dedicates itself to these aims.

Sum & Substance

A regular feature in ARMOR, where you may express your views in approximately 500 choice words—the effective medium between the letter and the article. This section is open to all on any subject within the bounds of propriety. Name and address must accompany all submissions. Name will be withheld upon request. No pseudonyms.

The Armored Replacement Training Center is a major component of The Armored Center at Fort Knox. While the primary mission of the ARTC is to produce replacement platoons for our armored units throughout the Army, the entire scope of its activities is far more wide and varied. In ARMOR *of March-April 1955, Colonel Popowski described in some detail the packet platoon system which is the revolutionary method devised at Fort Knox to produce trained replacement platoons rather than individual replacements. Herein the writers not only delve deeper into the packet platoon operation, but they extend their coverage to the mission, the organization and the many other activities of the ARTC. This coverage is particularly timely and interesting since the Armored Replacement Training Center is now heavily engaged in the training phase of the new Reserve Forces Act program, and is on the verge of substantial overall expansion.* ARMOR *is happy to focus the spotlight on such important aspects of training.* The Editor.

All Photos U. S. Army

BRIG. GEN. S. L. MYERS

The writer of the following article, a 1928 USMA graduate, served in all troop grades at Cavalry posts in Texas and the Philippines. During World War II he served in Europe with II Corps and the First British Army. After Sicily he was named DCS for operations, First Army, and remained there for the rest of the War. Subsequently he attended the Industrial College and served on the General Staff and the JCS. After commanding the 3d Armored Cavalry Regiment he was assigned as Chief, Joint Plans Staff, C-C, U. S. Naval Forces, Eastern Atlantic and Mediterranean. Returning Stateside he was assigned as Assistant Division Commander, 3d Armored Division. In March 1955 he was selected to activate the Armored Replacement Training Center, the position he now occupies.

If we should seek a slogan to guide permanent party personnel of the Armored Replacement Training Center, we would choose "MENTAL MOBILITY AND ELASTICITY." Although this is a dominant trait in any Armored soldier, it is doubly significant in the ARTC since our training organization, those directives under which we operate, our training missions and the magnitude of our training load are prone to vary with startling abruptness.

On March 15, 1955, after a long period of being in an inactive status, during which time the role of the ARTC was filled by the 3d Armored Division (Training), this command was reactivated. At that time it took over the personnel, the equipment and the responsibilities of the 3d Armored Division. Since that time the mission, the input of trainees, the permanent party personnel, the location of the unit, its equipment and its training facilities have varied continuously. Early in the spring of 1955 there was a rapid reduction in personnel and facilities in order to make a place for the rapidly growing TO&E 3d Armored Division. This involved a reduced input of trainees, over a 50 per cent reduction in the permanent party personnel and the requirement to condense into an unusually limited area. These reductions were accomplished by early July and from this time, and for several months succeeding, the ARTC reached its lowest ebb in strength.

Late in August we received the unexpected, nevertheless welcome, news that we were to become a part of the Reserve Forces Act of 1955 system of training with our first input then scheduled for October. This required a rapid development of subject schedules, lesson plans, cadres from an all too meager permanent party, additional housing, training aids and hundreds of associated problems to support an entirely new form of training with a different type of individual. Training was to extend for six months to include the Unit Training Phase. Coincident with the assignment of this new mission came the requirement to develop a long range Table of Distribution and an organization which was ultimately to include the training of a continuous load of 2000 of these young men in Armor and 4500 in Infantry. On October 15 the command reorganized again with the structure to perform this mission, but because of necessary restrictions, with only the permanent party personnel which had been authorized when the command was at its lowest ebb. Needless to say, this requirement presented many problems. Some of this will be touched upon by those who are subsequently to discuss details.

With the advent of RFA training, new and unusual developments transpired. In the first place, initial input was not as large as anticipated. We were off to a very modest start due to the fact that the youth of the country had had too little time to recognize the merits of the program. Perhaps it is well that the start was meager because we were afforded ample time to iron out the kinks. One of the outstanding features of this program, which is probably characteristic of anything so radical and new to the Army, was that the interest of unlimited numbers of individuals and groups throughout the country was aroused. This interest expressed itself in a desire to visit the ARTC and see how things were being done. Never has so small a group been inspected, talked to, photographed, televised, interviewed on radio and by the papers by so many people motivated by the desire to help the activity along! Most of this observation was favorable, constructive, educational and beneficial. Meanwhile, the command went actively ahead with the training at hand as planned and has now progressed far enough in this activity to be sound in expressing a few opinions. These are as follows: The majority of these young men who come here under the RFA Program are intelligent, energetic and motivated by the desire to do a good job. They respond readily to their instruction and learn fast. In some fields they are establishing records theretofore unknown at a Training Center and show every promise of being very fine individual soldiers when they return to their home Reserve or National Guard units. Their morale is high; disciplinary problems are surprisingly low. They show pride in themselves and in their organizations. We are convinced that this program will be a complete success and that it will eventually attain the proportions intended.

Late in December 1955, instructions were received from higher headquarters to prepare a further TD and to be ready early in 1956 to reorganize for an additional training mission of Infantry AUS pipeline personnel to include both basic and advanced individual forms of training. At this time, it was forecast that the initial input would be on 1 June 1956, and in numbers, 880. The program was to be developed to handle an input regularly per month of 880 until the buildup had reached a total load of approximately 5500. This planning has been completed and steps are being taken to procure and train cadre for this load.

No doubt our readers will be interested to know some of the problems involved with all this reorganization, contractions and expansion.

It is most gratifying to report that these problems are few and none have been insurmountable. All commanders, at least, will recognize that the problems are not unique. They are the problems with which every commander has to contend, to wit: Too few people in the permanent party or cadre; too many people with skills inappropriate to the mission; and the personal hardships encountered by trainer personnel because of inadequate housing. Perhaps these problems can best be exemplified by citing an example in each instance.

Take the matter of too few trainers. As all of our readers who have had experience with Armor will know, it requires more supervisory personnel to train Armor trainees than it does Infantry. It requires approximately 500 permanent party personnel in this command alone to maintain and repair the 450 assigned tanks. These are always over and above any personnel expected for average Infantry training. Yet many times, because of manpower ceilings, it has been necessary to operate with a ratio of trainers to trainees as low as available for Infantry training.

In the matter of permanent party personnel with inappropriate skills and MOS's, I cite as an example that at a time when this command was reduced to 74 percent of the authorized mechanics, there were still levies for overseas shipment of mechanics. As replacements from overseas we are frequently assigned perfectly good noncommissioned officers, but men with skills such as Quartermaster Warehouseman, Engineer Bulldozer Operator, Transportation Corps Dispatcher and the like. We can retrain these men and we do, but it takes months, during which time they are ineffective as trainers in the field of Armor.

As you all know, housing for officers and noncommissioned officers is critically short world wide. It is quite as short here at Fort Knox, and as a result, many company officers and noncommissioned officers are required to travel as far as 35 miles from their homes. The companies, in order to accomplish the 44 hours of supervised training per week required by the ATP, must start their day from 0430 to 0515 in the morning, depending on how far from the barracks their point of training is; and they complete their day anywhere from 1800 to 1900. It is easy to see how little home life these individuals have. However, in spite of these difficulties which will probably be with us always, the morale is good and the enthusiasm with which these young officers and noncoms undertake their responsibilities is a joy to any commander's heart.

It is stimulating to be on the brink of a big expansion and we in the ARTC believe that in some degree, at least, it is due to recognition of good work already done. Certainly this type of work taxes an individual's ability and mobility to the full; but, with all the trials and frustrations, there is not a more gratifying type of service in our Army. There is nothing more appealing or inspiring than to witness the transformation of raw young civilians into good disciplined soldiers.

BRIG. GEN. SAMUEL L. MYERS

COL. C. J. PARSONS, JR.

The writer of the following article, a 1939 graduate of USMA, served in Europe during World War II with the 102d Infantry Division as both a Reconnaissance Troop Commander and Division G2. Subsequently he was assigned to G2, EUCOM and CO of the 628th Tank Battalion. Returning to the States he held various commands in the 3d Armored Division prior to his present assignment as Chief of Staff of the ARTC.

The ARTC is a Table of Distribution (T/D) unit. A cardinal Department of the Army policy in the operation of T/D units is austere economy of personnel. With the several abrupt changes in mission and training load we have had in our short period of reactivation and with our constant paucity of permanent party personnel, we have endeavored to construct a basic organization which, while economizing on personnel, will be flexible enough to accommodate variations in mission and fluctuation in training load by activation or inactivation of particular units as the occasion demands. Our objective is to consolidate maximum administrative, supply and maintenance responsibilities in the ARTC headquarters, thus leaving regimental and lower echelon commanders free to concentrate on training activities and the inescapable disciplinary and housekeeping chores of command.

Our staff is organized with the normal General and Special Staff Sections, less a Comptroller, whose duties are performed by G1. The Deputy Commander directly supervises training and operational matters while the Chief of Staff is primarily involved with administration and organizational matters and, of course, in the General Staff coordination. The G4 and AG Sections are enlarged, but the other staff sections are comparable to those of a division in size and grade structure.

In order to conserve manpower and material, all personnel, supply and wheel vehicle maintenance functions are centralized at ARTC Headquarters, with responsibility for the conduct of training and for tank maintenance centralized at regimental level. Regimental and battalion staffs are small except for S3. Regimental and battalion adjutants perform the normal S1 duties except that no Personnel Section is assigned to the regiments. Regimental and battalion S4 sections are very small (except for regimental tank maintenance sections) and are concerned only with supervision and coordination of integral supply activities.

The ARTC Adjutant General, in addition to normal administrative matters, processes and maintains personnel records for all men who are in training. Forecasts of arrival reach the AG approximately five weeks before personnel arrive for training, while orders and personnel records usually come in about seven days prior to the individuals. This permits determination of the units to conduct training of specific personnel quotas and allows time for orders to be published assigning individuals to training companies. The Receiving and Processing Company receives all personnel, checking their personnel records to be sure that the individual's physical status and aptitude scores qualify him for his intended training. If this is not the case, a more suitable type of training is directed. Since RFA personnel come directly from civilian life, their processing includes initiation of records, testing, physical examinations, shots, clothing issue, etc., which normally requires about three days. Several weeks prior to the completion of training, personnel are reported to the Department of the Army for assignment instructions which are usually received during the next-to-last week of training.

One of G1's main concerns is the acquisition and retention of qualified personnel, particularly tankers and track vehicle mechanics. Most second lieutenants are assigned on completion of the basic course at The Armored School and receive their first troop training in the ARTC. Many of these lieutenants eventually accompany packet platoons overseas; others, most of whom are not career officers, spend their entire commissioned service at ARTC. Enlisted replacements are, for the most part, returnees from foreign service.

All supplies and equipment used by the units are drawn and issued by the office of the G4, ARTC. This includes the operation of a 100,000 gallon gasoline dispensing station which services not only the tanks of the ARTC but also those of other Fort Knox units. In the interest of supply economy, certain items of equipment required by units during specific stages of training are consolidated and maintained within the ARTC Equipment Pool. This equipment includes such items as tents and tent stoves, complete field ranges, ice chests, sleeping bags and gas masks, and is issued as required to units undergoing training on the various Fort Knox ranges and bivouacs. Consolidation of equipment not only reduces the quantity of equipment required for the proper support of training operations but also facilitates the care, cleaning and maintenance of this equipment.

Centralized maintenance of Ordnance equipment is conducted wherever practicable at ARTC or regimental level. "C" and "D" services on our 450 tanks are performed at regimental level, eliminating the customary large battalion maintenance section. "C" and "D" services on wheel vehicles are performed at one central motor pool controlled by ARTC G4. A tank maintenance problem not normally encountered in a TO&E unit is the replacement of gun tubes. The huge amount of service firing conducted in the ARTC requires that gun tubes be replaced at the rate of 20 per month. Except for individual weapons, small arms needed for training are kept in a centralized Weapons Pool which is responsible for their issue, maintenance and storage. Storage and distribution of ammunition are also centralized.

Our experience has proven that the consolidation of administration at ARTC Headquarters and decentralization of training responsibility to the regiments is the most efficient way to accomplish our mission, with a minimum of personnel and equipment.

COL. CHARLES J. PARSONS, JR.

LT. COL. C. F. RYAN

The writer of the following article served on CCC duty prior to the War. During the War he served in Europe as Executive Officer of the 786th Tank Battalion. After a Stateside tour he returned to Germany on occupation duty with the Constabulary. After attending TAS he was assigned to Civilian Component duty and later attended C&GSC. Following a tour in Korea he was assigned to the 3d Armored Division until he became G3 with the inception of the ARTC.

Since its reactivation in March 1955, when it assumed the mission of training Armor replacements and basic trainees, the ARTC has undergone numerous changes both in its training missions and overall organizational structure. A standing quip around ARTC is the question, "What new Table of Distribution shall we pull out of the files this time?" This is actually no joke, at least not to the personnel charged with the overall training responsibility, for they have found through experience that each change of mission has required a new concept of both organization and training methods. These numerous changes would seem to tend toward confusion in the minds of the staff and trainer personnel but for the stress on flexibility in organization, methods and thought which is fundamental here and which has molded what today can be termed "a happy outfit"—and, we hope, an efficient one.

This attitude may seem peculiar for a training center. It is common for many people to get a hazy or mixed up picture in their minds of the activities and purposes of any training unit. They conjure up impressions of monotonous hours and weeks; of instructors repeatedly going over and over the same material each training cycle until it becomes boring and automatic. We attempt to avoid monotony and rigidity in all that the ARTC does, and we find that actually any tendency toward monotony is relieved by these frequent changes in mission and methods.

In the accomplishment of its manyfold missions, the ARTC utilizes the current Army Training Programs as bases of instruction. Basic training is conducted under ATP 21-114 for RFA trainees; ATP 17-600 is the basis for the Advanced Individual phase for Armor trainees, both AUS and RFA; and CONARC has provided a special four week Basic Unit program as the final phase of the six month RFA active duty period. Of course, the Common Specialist schools follow prescribed Programs of Instruction throughout the courses for Clerks, Mechanics and Radio Operators. For our projected Infantry training, ATP's 7-600 and 7-601 will probably apply.

The culmination of an Armor trainee's instruction—on the range—a target hit.

Responsibility for the conduct of training in the ARTC is delegated directly to regimental commanders. Normally commanders implement this responsibility by means of specialized and expert instructor groups employing the committee system of instruction, although command responsibility for the final proficiency of trainees never ceases. Thus, regimental, battalion, and company commanders are in close control and constant supervision of all training activities. Finally, the G3, ARTC, enunciates training policy, prescribes general training procedures and exercises the necessary control of activities to insure coordination.

Our training requirements call for careful allocation and close coordination of training areas, facilities and ranges. Requirements for physical facilities not integral to the ARTC are consolidated in G3, ARTC, and submitted to G3, The Armored Center. There are many other units at Fort Knox that must utilize range facilities and maneuver grounds; time is short and our requirements must be coordinated. Hence, once we have scheduled the use of a range or a facility, like the U.S. Mail, neither rain, nor sleet, nor snow is allowed to stop its use, for our trainees must graduate on schedule.

In the Advanced phase of Armor training, we employ "group integrity" from the initiation of training: our Packet Platoon system. By this method, each man gets the group feeling and the team spirit. Tank crews in packet platoons live together, train together, are shipped out together and ultimately reach their final destinations as compact units. We are exploring the feasibility of adapting this system to our RFA trainees and perhaps later to our Infantry training.

The overriding concept of training in the ARTC is that of "associated development." All elements of instruction are welded together and pointed toward a definite goal: the production of an aggressive soldier, confident in his equipment, in his weapons and in his ability to use them in closing with any enemy and killing or capturing him.

Lt. Col. Charles F. Ryan

CAPT. T. J. SMITHWICK

The writer of the following article was commissioned in 1946 at Fort Knox. He served a two-year period with the 1st Cavalry Division. Returning to the States he was assigned to the 1802d Special Regiment, USMA. His next tour was with the 2d Armored Division. After attending TAS he was assigned to his present duty as Company Commander, Company D, 1st Armored Training Regiment, ARTC.

A company commander training Armor packet platoons in the 1st Armor Training Regiment encounters challenges seldom found in other phases of Armor. The final outcome of his response to these challenges manifests itself on graduation day, when, after ten weeks of patient cultivation, the CO sees before him nine platoons of well-trained and confident tankers ready to join any Armor unit anywhere in the world. The men, once awkward basic soldiers, can now move, communicate and shoot as a team. Although the means and methods by which the basic soldiers have been molded into tankers vary widely, the immediate responsibility for the integration of these means lies with the company commander.

As a company commander, I have at my disposal the most important formal element in the training program, the Armor Instructor Group, 1st Armor Training Regiment, which accounts for ninety per cent of the scheduled instruction. This group, a stepchild of the "Committee System," relieves the company commander and his cadre of the many headaches and frustrations involved in preparing and presenting daily quality instruction. The group also insures desirable uniformity and continuity of instruction so that each trainee in every unit can be taught by the same high standards.

Despite the share of the burden assumed by the Instructor Group, again the primary responsibility for operation is borne by the company commander; the man whom the troops regard as their leader, and the officer they see every day at class or in the field.

A glance at a company manning board by the uninitiated would result in many questions, particularly concerning personnel. The current Table of Distribution authorizes only one officer to assist the company commander. Five sergeants and forty-five holdover tank commanders make up training cadre. By what method then do we organize, train and control those nine platoons? Of great assistance to the company commander are our "packet platoon leaders," newly commissioned 2d Lieutenants and recent graduates of the Armor Officers Basic Course of The Armored School. They draw their first assignment, subsequent to commissioning, in the training companies and find that their "education has just begun."

Another indispensable aid to the company commander is the "TDY packet Platoon Sergeant." They are NCO's of the first three grades placed on TDY to the company to undergo training with a platoon destined for assignment to the TDY sergeant's parent organization. They return there with a platoon upon completion of training.

Lastly, and I consider this most important, the company commander has his trainee tank commanders, composed of forty-five outstanding trainees retained from the previous cycle, around whom the company commander builds his tank crews for the new cycle. The selection of these trainee tank commanders is of paramount importance to the company and a challenge to his ability to judge men after only brief acquaintance. The best method I have found thus far for the selection of the trainee tank commanders is by the nomination and "murder-board" method. Beginning in the third or fourth week of each cycle each of the incumbent trainee tank commanders, TDY platoon sergeants, cadre and packet platoon leaders nominates weekly a trainee or trainees who, in his opinion, possess the qualifications to make a tank commander. By the eighth week, through the process of cross reference and elimination, the company commander can be assured that the weekly nominations will produce a group most highly qualified to be his new tank commanders.

I have found that to insure an optimum distribution of learning aptitude throughout the platoons, the crews should be formed on a basis of the GCT by combining two men with high scores with two men in the lower aptitude area and a trainee tank commander, thus teaming the strong with the weak to help the latter.

The major components of instruction during the training cycle are scheduled to be successive in nature. The first six weeks include those subjects general in nature to prepare the trainee in tank driving, maintenance, communications and pre-range gunnery instruction. The last four weeks are devoted almost entirely to subcaliber and service firing to include familiarization and record firing. Tank driving and service firing are most popular with the trainee, while maintenance is the most difficult to impress upon him. However, I have found that some degree of enthusiasm can be worked into the problem of maintenance by competition among crews and platoons.

The success or failure of the cycle depends also on the availability and proper operation of the company's thirty M47s. Mainstay of the maintenance at company level is the support section of mechanics, turret artillery repairmen and radio repairmen headed by the motor sergeant. This group assists the trainee tank commanders with their first echelon maintenance and performs minor second echelon repairs. The weekly inspections performed by this section are of primary importance. All scheduled maintenance and repair above company level is performed by the Maintenance Section, 1st Armor Training Regiment.

Administration and supply problems take much of a commander's time in TO&E organizations; however, here all personnel records are maintained at ARTC level with the company responsible only for the morning reports (cadre, trainee tank commanders and pipeline) and individual training records. This is highly important inasmuch as advanced individual training is usually where the requests for school, allotments, hard-ship discharges, board action, etc., that were initiated during basic training, usually catch up with the individual. Frequent scheduled inspections of individual and organizational clothing and equipment ease the supply sergeant's "end of cycle" statement of charges burden. Constant reminders and concurrent instruction in maintenance of OVM protect the commander and individual from loss of these costly items.

The commander of a training company faces many problems and challenges foreign to those encountered in a line company. He has the job of coping with young, inexperienced men undergoing difficult and often unpleasant training; and with the concomitant morale problems. By overcoming these same difficulties, however, he can claim the hard-earned satisfaction at the end of each cycle of noting the transformation of his recruits of ten weeks before to full-fledged tankers ready for integration into any TO&E Armor unit.

CAPT. THELTON J. SMITHWICK

2D LT. J. T. FRENCH

The writer of the following article, a 1953 ROTC graduate from Western Michigan College, entered active duty in 1955. After attending The Officers Basic Course at The Armored School he was assigned to the ARTC. Recently he has been designated as packet platoon leader, Company F, 1st Armored Training Regiment.

The primary responsibilities of the leader are first, the accomplishment of his mission and second, looking out for the welfare of his men. These two requisites of good leadership are a basis for my thinking and actions as a packet platoon leader.

Orders to active duty sent me to Armor Officers Basic Course at The Armored School for 16 weeks of detailed branch training in the specialized and technical Armor subjects. This familiarization instruction covered the broad scope of Armor operations, laying a firm foundation for my job ahead.

Midway along in The Armored School, orders came assigning me to the Armored Replacement Training Center as a packet platoon leader. Little did I know at that time the implications of such an assignment nor was I aware of the actual requirements involved. However, it was but a short time before I became fully conscious of my new responsibilities. Officer Personnel Branch, ARTC, assigned me to the 1st Armor Training Regiment. At regimental level I was interviewed by the Regimental Commander who oriented me on the full particulars of the packet platoon system. This system, I learned, holds certain practices not common to the ordinary training outfit. Here the men live and train as a team within a team, working together in fixed tank crews organized into fixed platoons. The objective behind this program is to initiate from the outset a sense of unity and an early response to the authority of the tank commanders and the leadership of the platoon leader. So trained, these men are prepared for permanent TO&E assignments as a complete and well integrated unit ready to fit as a replacement platoon into the larger organization. This packet system seemed most impressive and well worth a good many hours of devoted attention. I was not wrong in this surmise as time soon proved.

From regiment I reported to the commander of the 1st Battalion who in his interview carried me through the battalion functions within the training program. Particular emphasis was placed on the tank maintenance system which I saw first hand during a three day tour of the ARTC tank park. The problems involved just in keeping the equipment in operating order suddenly became a staggering reality. Tightening wedge nuts, packing grease fittings, cleaning air filters, blasting off caked mud from the suspension system and an endless list of checks all go into the meticulous preparation of a tank for scheduled maintenance inspection. Maintenance cannot be overemphasized; this point I carefully noted to carry back to the platoon I was to command.

My platoon assignment was made at company level. Soon after receiving my twenty-five men I gathered them together to explain the aims and objectives which I expected to accomplish. At this time every man was given the opportunity to voice his opinions and a chance to iron out any misunderstandings or false impressions.

During the first week of training the company attended an orientation given by the Commanding General of ARTC for all new armor trainees. This was an impressive affair with the famed ARTC Honor Guard setting the decisive pace which was picked up in the General's message. He related that "the spirit to win is strong" in ARTC. "Armor," he says, "is a proud branch in which the best is not good enough. Therefore, it is necessary to strive for constant improvement and perfection in every activity."

These aims are those which I strive to incorporate in the minds of the men. Throughout the long hard hours of rigorous training I seek to invite a competitive spirit for individual improvement of the trainee. Not only do they find the going a little tough, but I too have my trying moments. Attendance at all training in addition to normal company duties keeps me constantly on the go.

There are always a certain number of men who can't grasp the technical instruction the first time presented, or who miss training altogether for one reason or another. Such cases necessitate added assistance and I often find myself working with such men to help them fill in the missing links in their training. Due to the vast amount of varied material presented in the classroom it is difficult for the men to retain all pertinent instruction from day to day. To overcome this difficulty I find it beneficial to hold informal review quiz sessions during "break-time" or concurrent training classes. This competitive questioning tends to boost morale and brings the platoon closer together as a thinking team. Needless to say, this method is an effective way of confirming important instructional data.

Range time scheduled during the

last few weeks of training provides the essential practical application of all previous training. These are the longest and most demanding days for the platoon. Maximum alertness on the part of every individual is the only way a range can be fired safely and effectively. I find it necessary to brief and rebrief the men on the range safety regulations and insure that they know exactly what the firing requirements are and just how they are to be accomplished. It is very satisfying to see the training results as evidenced by the individual firing scores. The men, too, hold a sense of self-confidence and pride in this accomplishment.

Upon completion of the range season the packet platoon is ready for graduation. Throughout the ten-week cycle of working and training together as packet platoon and platoon leader, I have kept a constant observation and individual inspection of my men. I now know each man personally and can thereby fit him into his best suited position with the tank crew of the platoon. The end result is a proud-looking, fighting unit; one which holds mutual respect, trust and confidence. I have grown immeasurably in the techniques of effectively controlling my men; they are the true gauge of my command.

Platoon and officer are now ready for overseas shipment to a TO&E armor organization. We are a skilled and unified team—a packet platoon.

2D LT. JERROLD T. FRENCH

PVT. V. C. BRAY, JR.

The writer of the following article entered the Army in July 1955 after attending the College of Puget Sound, Tacoma, Washington. After eight weeks of basic combat training at Camp Carson, Colorado, he was assigned to the ARTC for Individual Advanced Armor Training. Upon completion of ten weeks of training he is now acting as a cadre tank commander, Company A, 1st Armor Training Regiment, ARTC.

While training tankers the ARTC also conducts basic training for the 6-month RFA volunteers. During the second week men receive bayonet instruction.

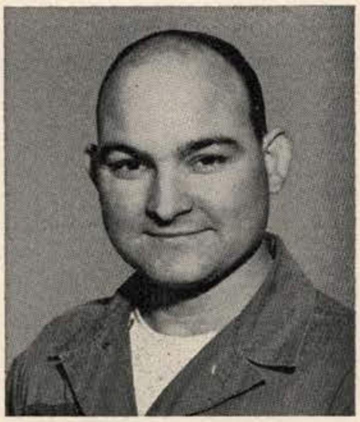
Have you ever owned a tank? Some fellows have their yachts, others have planes, but few ever receive the honor of having a tank. There is a certain thrill in knowing that you command a $300,000 machine and its crew. One doesn't just suddenly get a tank, he first has to endure ten hard weeks of training. Looking back on those ten weeks it seems like a short time, but I can remember when I wondered if they would ever be completed.

Now that I, as a tank commander, have my own crew I believe I can fully appreciate their situation. These men come here knowing so little about tanks that some know only that they run on tracks and have a huge gun. As an introduction I take them down to the tank park at the first opportunity and show them the tank. I explain to them in a rather simple manner the working of the turret and the equipment inside. In this way the men gain some idea of what to expect in the coming class sessions. During the following weeks I spend approximately an hour every Saturday afternoon summarizing and explaining the past week's classes. We have lectures, tests, examples, discussion and practical work. All the instructors are experts in their fields; so the men get the very best in Armor education.

If you own a car you probably try to keep it in the best possible condition. Tanks demand that same attention to details. There is maintenance every day whether I use my tank or not. Each month my crew helps me to prepare this machine for inspection from bog to stern. The Army is ever mindful of our hard work and the best tank crews get certain privileges such as afternoons off and week-end passes.

The crews are assigned a place to sleep in the barracks and that becomes their area. From that time on they are part of a "Packet", which is a platoon that usually stays together. The crew will remain the same right along with the platoon, and together they are shipped out at the end of the cycle. From the company forty-five men will be chosen for their proficiency as gunners, mechanics and leaders to stay on as new tank commanders. One of them will take my place when my crew and I ship out at the end of this cycle.

Pvt. Virgil C. Bray, Jr.



SFC. R. F. THOMAS

The writer of the following article entered the Army in 1946, taking his basic combat training at Camp Crowder, Missouri. Since then he has had varied experience which incldues a two-year tour in Company I, 18th Infantry Regiment, 1st Infantry Division in Germany. He also was assigned in Korea with Company D, 31st Infantry Regiment, 7th Infantry Division for 14 months. He is the Chief Communications Instructor, Communications School, 1st Regiment, ARTC.

Date: 7 Jan. 56. *Time: 0720. Place:* Bldg. 2320. My name is Sergeant Thomas.

0730: The company turns the corner and stops in front of our building. The First Sergeant comes in for his instructions.

Two minutes later the men come streaming through the door and take their seats.

I walk to the stage, take my place and introduce myself as well as my subject.

As I look over the class I can see large and small men, some mad at the world, some glad the world is still here. Most of them look tired. They were up at 0500. *My job:* Shake the sleep out of their eyes and teach them communications.

I tell a joke to wake most of them up. Then I start the instruction on Voice Radio Procedure and Radio Security. Four hours pass by. I look at the men and study their faces for a brief moment. My thoughts go back to the days in Korea when the going was rough. I know how important it is that they know their jobs.

Procedure and Security complete, I start the class on the Introduction of the Tank Radio, covering the frequency allocation of all three branches of service, showing the five components of the Radio Set AN/GRC-3.

I realize how important it is that they know how to contact Artillery and Infantry as well as other tanks.

So I have a Radio Team set on a set channel. I tell them a story about an antitank gun in the woods. They can't see him, but they can hear him. I tell them they would put the tank in a turret defilade position, then call Artillery to blast the antitank gun out of the woods. I have a man outside with artillery simulators to give it the real effect. After the Artillery is called in and lifted, I tell them to call the Infantry to clean out the woods to make sure the antitank gun is silenced. Then a man sets off a series of firecrackers outside to give a realistic effect. In this story I show how important it is to have a radio and to know how to operate it.

1115: Chow time, so I break the class. The men have gone to eat chow and I sit here in the classroom, a lot of things going through my mind. I wonder if I have done all I can to teach communications to men who may have to fight a war. I search my mind for weak points in the instruction, making a mental note not to emphasize them when we give practical work on Radio and Voice procedure.

Well, I leave the Communications building and go to chow, and return.

1220: I sit waiting. I have the same men for two more hours this afternoon.

I look out the window as I hear them approach. It is cold out, but most of them have grins on their faces. They look like they enjoyed the noon meal.

The men stop in front of the building. The First Sergeant runs them into the classroom out of the cold. I take over.

After they are seated, I return to the stage to instruct them on the operation of the radio set.

1440: Two hours have gone by fast. The trainees are moving on to another class, another subject. Some have learned a lot in the last six hours, some haven't.

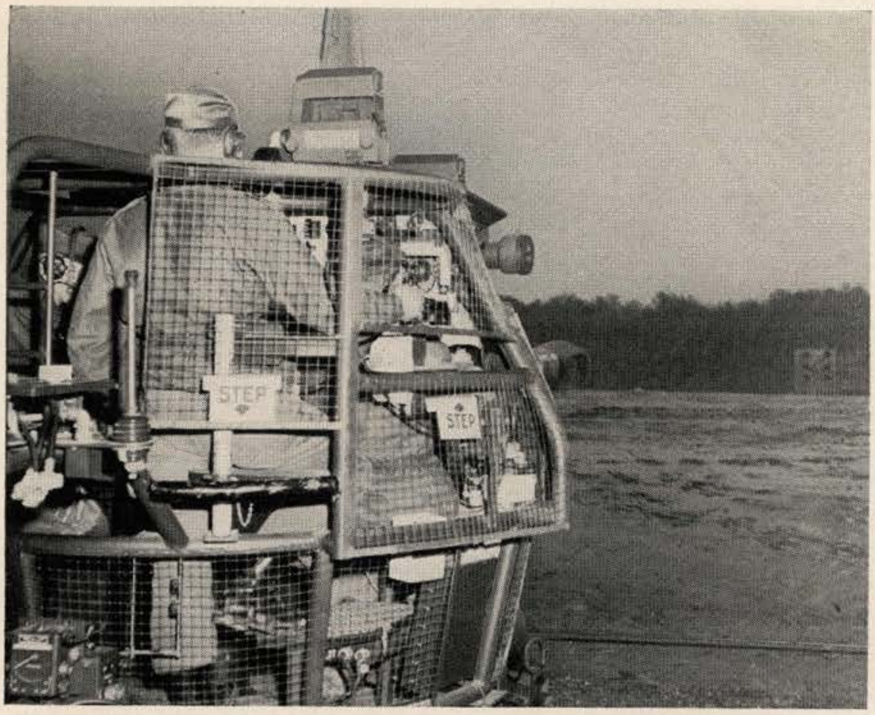
The ones who just couldn't understand all we said will understand before we are through, for they will come back to us for eight hours practical work on the radio set and voice procedure. In the meantime, they can read and study the literature we have given them.

1700: We close our doors, lock them and leave for the barracks. I think of the day and what I have tried to teach these men, thinking how important it is: knowledge of proper communications may well be the key to life or death.

Sfc. Roy F. Thomas

PVT. T. G. MICHOS

The writer of the following article entered the Army in August 1955 after graduating from Harvard University and attending the University of Athens, Greece, for one year. He received his basic training at Fort Dix, New Jersey. He is presently assigned as an Armor trainee, Company D, 1st Armor Training Regiment, ARTC.



The tank turret trainer shown firing on a moving target at Wilson Tank Range.

The ARTC trainee with three months' service has morale problems different from those of the soldier who already has a permanent assignment. Because psychological attitude influences efficiency, the administrators and planners of training programs should understand these morale problems. These men must necessarily repress apprehensiveness over being combat-ready, although virtually no pressure from imminent combat exists. For this generation of tankers Korea means a possible future assignment and not a memory.

If the new man on his first trip to The Armored Center isn't precisely destined for the halls of ivy, he is entering to grow in wisdom, and certainly to accelerate the maturing process so rudely initiated in Basic Training. Fresh as he is from his two-week leave, the trainee realizes immediately that his "Army Career" hasn't yet begun. He is faced with the fullest ten-week period of his life, and he has a mission to perform without the secure status of a man with a regular job. He must continue to train on the most formidable object yet encountered as a soldier; that modern juggernaut and immutable machine, the tank.

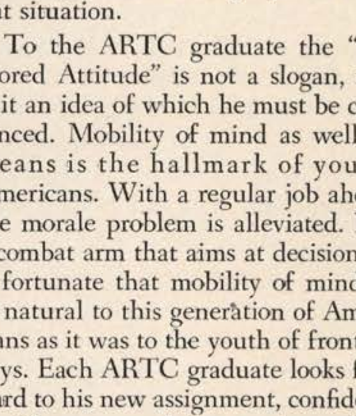
The morale problem is thus a complex: the new tanker finds himself at the unconsidered bottom of a hierarchic scale though only twelve weeks from equalitarian antecedents at home, and he finds himself without a definite daily function in a society of specialists. Acquired discipline carries him through, but comforting order exists for the knowing only; on the planning board in G3 or at the dazzling heights of providence and omniscience represented by the mysterious gentlemen, the lieutenants. In the crystal ball of his meticulous spit-shine, the humble tanker apprentice sees at first only muddy tracks, the blank whiteness of the turret interior and his own well-lubricated field-jacket.

Within a few days after reporting to ARTC, the trainees form strong friendships within crews or in the unit which means most to the new soldier; his platoon. The new trainees are introduced to the strict discipline of the armored unit barracks, the extra-tight beds and the full-field inspections. The TDY sergeants constantly scrutinize the ranks for men to take back with them to their regular units. The trainee meets his Tank Commander, the man who will determine either the success or the mere perfunctory fulfillment of the training requirements.

In classes for five weeks the trainee turns from radios to driving, to range finders and back to maintenance. The instruction is excellent, but the subjects are vast and bewildering. Thus he meets the greatest of the necessary evils, repetition. Soon, however, the range work fits the puzzle together. With competent instructors directing, the trainee integrates his class work and with his Tank Commander's help sends the first .30 caliber and 90mm rounds target bound. Yet the best familiarizing school of all is the daily first echelon maintenance in the tank park. The strict attention to detail learned there becomes significant on the ranges and in the projected combat situation.

To the ARTC graduate the "Armored Attitude" is not a slogan, nor is it an idea of which he must be convinced. Mobility of mind as well as means is the hallmark of young Americans. With a regular job ahead the morale problem is alleviated. For a combat arm that aims at decision, it is fortunate that mobility of mind is as natural to this generation of Americans as it was to the youth of frontier days. Each ARTC graduate looks forward to his new assignment, confident that he can meet the most exacting requirements of his new profession.

PVT. THEMISTOCLES G. MICHOS



1ST LT. S. W. BACHINSKI

The writer of the following article graduated from OCS, Fort Riley in May 1951. Upon receiving his commission he attended TAS and was assigned to the 141st Tank Battalion, accompanying that unit to Europe. He next was Assistant S3, 899th Tank Battalion. Returning Stateside he was assigned to his present assignment as Company Commander, Company C, 2d Armor Training Regiment, ARTC.

With all due respect to the trainees of Company C, the old saying, "You can't judge a book by its cover," has been proven to be correct again.

When the much-publicized six month "RFA" personnel filed into our unit dining hall on the 5th of December for their first meal, we were all but pleased. Most of our 171 men had long, shaggy hair, drape-shape suits, or ill-fitted Army clothes which gave us the impression that we had received more than our share of misfits. Fortunately for us, however, this initial impression proved incorrect.

At the present date the cadre and I are very proud of our combined NG and ER trainees and this is why—our trainees are a healthy, happy, ready bunch who have already broken two records at Fort Knox; one in the Physical Fitness Test and the other on the known-distance rifle range.

Competition in the Physical Fitness Test was so keen between individuals, squads and platoons that before we realized what was happening we wound up with a company average of 263, the highest average for any RFA company to date. The receipt of the news that our trainees broke the standing physical fitness test record, followed by the accompanying pat on the back from our Commanding General, came at a very opportune time. The trainees now acquired the attitude that they could do no wrong—and proceeded to try and prove it.

We qualified one hundred per cent of the men who fired the Standard Course with the M1 Rifle. Needless to say, we thanked the weatherman for beautiful firing weather; one can't do too badly with 65 degree temperatures, no wind and a clear sky. Just as we were finished on the 500 yard line, one of my trainees came up to me and asked, "Is this it? Can we come out on our own time on Sundays to fire?" He had qualified as a high Sharpshooter and was disappointed!

I have been told by our committee instructor personnel that although our 17 to 18½ year old trainees were initially slower adapting themselves to the Army's methods of instruction, they are now generally more receptive and more easily handled than AUS trainees. It was surprising too, to find out that a good percentage of our trainees had not finished high school and a few had not completed the eighth grade. Those trainees who had not attained a fourth grade educational level were transferred to Fort Jackson, South Carolina, for instruction in basic education subjects. In addition to the usual number of men in the hospital, we average daily about five men on sick call. Self-diagnosis of all diseases, to include leprosy, is waning now and we hope it will end soon. This self-diagnosis occasionally provides a good chuckle, but usually irritates the cadre and has wasted good training time. Thanks to the continued interest exhibited by our battalion and regimental commanders in the men's welfare, plus our move into renovated billets, high morale has been sustained and our sick call reduced.

The shortage of cadre has necessitated our using AUS trainee holdovers from the Advanced Individual Armor training cycle as acting platoon and squad leaders. Their understanding of the problems of the new trainees has done much to help these men get the most out of their training. For these boys, congenial methods of instructing, including patient explanation, demonstration and close supervision, are most suitable. Basic considerations in the selection of our cadre were excellent, and we received men of excellent military bearing, intelligence and high moral standards.

The case of Private Bortniker of New York typifies the attitude of these boys. After he had just made 459 points on his physical fitness test—the highest score attained thus far by an RFA soldier, he asked his platoon leader if he could have Sunday afternoon off as a reward for his fine showing. He wanted to go to the Post gym to start getting in shape.

When Private Adkins of West Virginia reported in initially, he came to my office and started to salute, but dropped his hand and said, "Sir, I just can't get on to all this Army stuff but I can shoot a rifle. I killed 168 squirrels this year." I can believe it now; he qualified as an Expert with the M1 rifle.

Topic of conversation for our RFA trainees now—What records can we break next?

1st Lt. Stephen W. Bachinski

1ST LT. H. J. STEVENSON

The writer of the following article was commissioned in October 1951 after completing school at Fort Benning. Subsequently he was assigned to Intelligence School in Japan. He served as Company Commander with the 2024th Regiment in Korea. Returning Stateside he was a Company Commander in the 3d Armored Division prior to his present assignment as Operations Officer, Instructor Group, 2d Regiment, ARTC.

In October, 1955, the Armored Replacement Training Center welcomed the first group of volunteers for the new Reserve Forces Act Training Program. As the raw recruits stepped off the busses, some were dressed in coat and tie, some were in open shirt and slacks, and others—the National Guardsmen—were in uniform. Like all recruits of past Army history, they were undisciplined, still retaining the casualness of a civilian, but in most eyes there was a light of expectancy and hope. This expectancy was to be fulfilled.

Within the ARTC framework, the 2d Armor Training Regiment at this time shelters, feeds and trains all volunteers under the new program. (Eventually, the Infantry volunteers will be assigned to the 3d Training Regiment, and we shall have only the Armored component.) Although the six months training period requires guidance under three different ATP's, i.e., ATP 21-114 for Basic Combat, ATP 17-600 for Advanced Armor Training and ATP 17-201 for Advanced Unit Tactics, the administration and training plan allows the individual to remain in one unit during the entire period. Most training, particularly in technical subjects, is conducted by an Instructor Group, a special staff section directly responsible to the Regimental Commander.

Instructor Group personnel are carefully selected and drilled to perfection in their specialties. The group works closely with company cadre in meticulous arrangement of training periods to insure that no essential detail is slighted and that the slow learners get patient, individual attention. Educational levels, aptitude scores and special interests of trainees are considered so the instruction may be put across in the most penetrating and interesting manner.

The RFA trainee has shown an unexpected and exuberant enthusiasm for the squad tactical training of the seventh week of the Basic Combat phase. Critical comments from the trainees themselves indicate a feeling that not enough time is spent on squad tactics. There are practically no complaints about rough weather, long hours or exhausting work in their comments. The most popular tactical problem appeared to be the last phase of a 13½ hour defense problem. Most trainees left the problem area both surprised and stunned, after seeing a demonstration of the defensive fires of a TO & E rifle squad, reinforced by mortar and simulated overhead artillery.

Weapons training is probably the most important segment of the basic training program. The program also includes, however, all basic subjects and the Armor trainee then, in his Advanced Individual phase, gets the full treatment—tank gunnery, tank driving, maintenance and all the rest. No matter what the subject taught, the average RFA'er has been enthusiastic and has shown in proficiency tests that he has learned and remembers well.

1st Lt. Herbert J. Stevenson

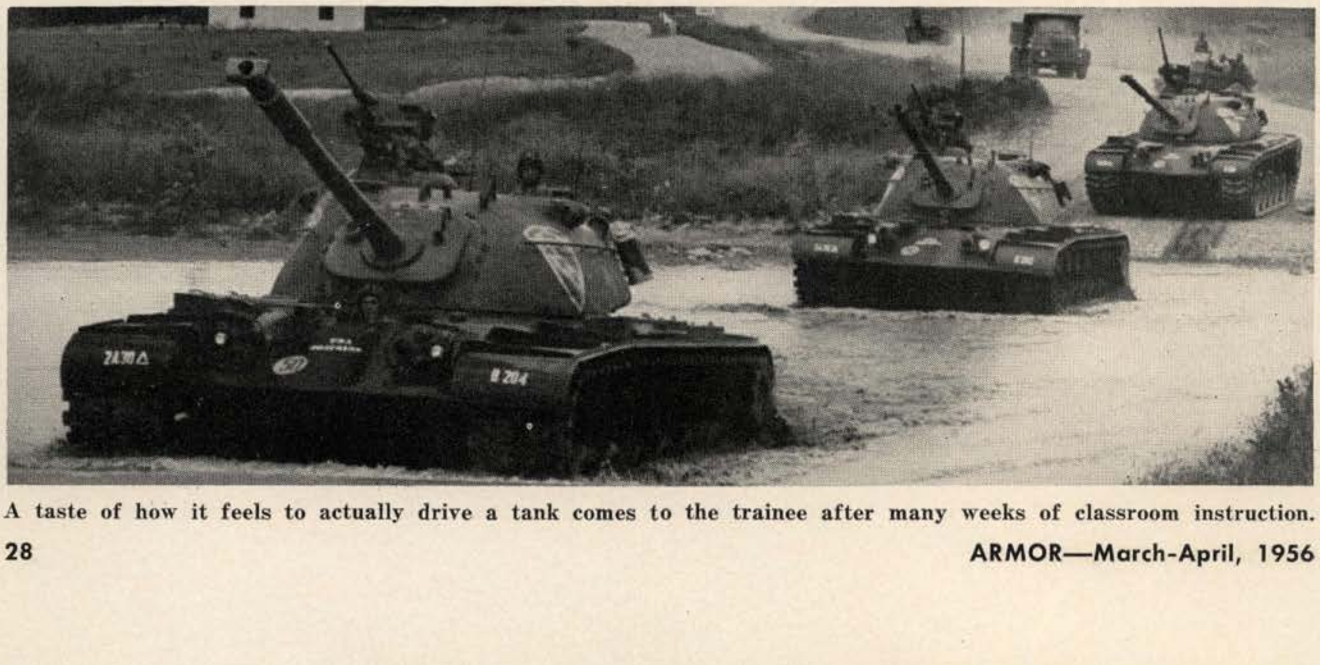
PVT. L. J. MURPHY

The writer of the following article enlisted in his local reserve unit, the 102d Reconnaissance Company, Kansas City, Missouri, in September 1955 after completing one year at Rockhurst College. After deciding to fulfill his military obligation by volunteering for six-months active duty under RFA he received his basic combat training at Fort Leonard Wood. He is in his Advanced Individual Training in Company A, 2d Regiment, ARTC.

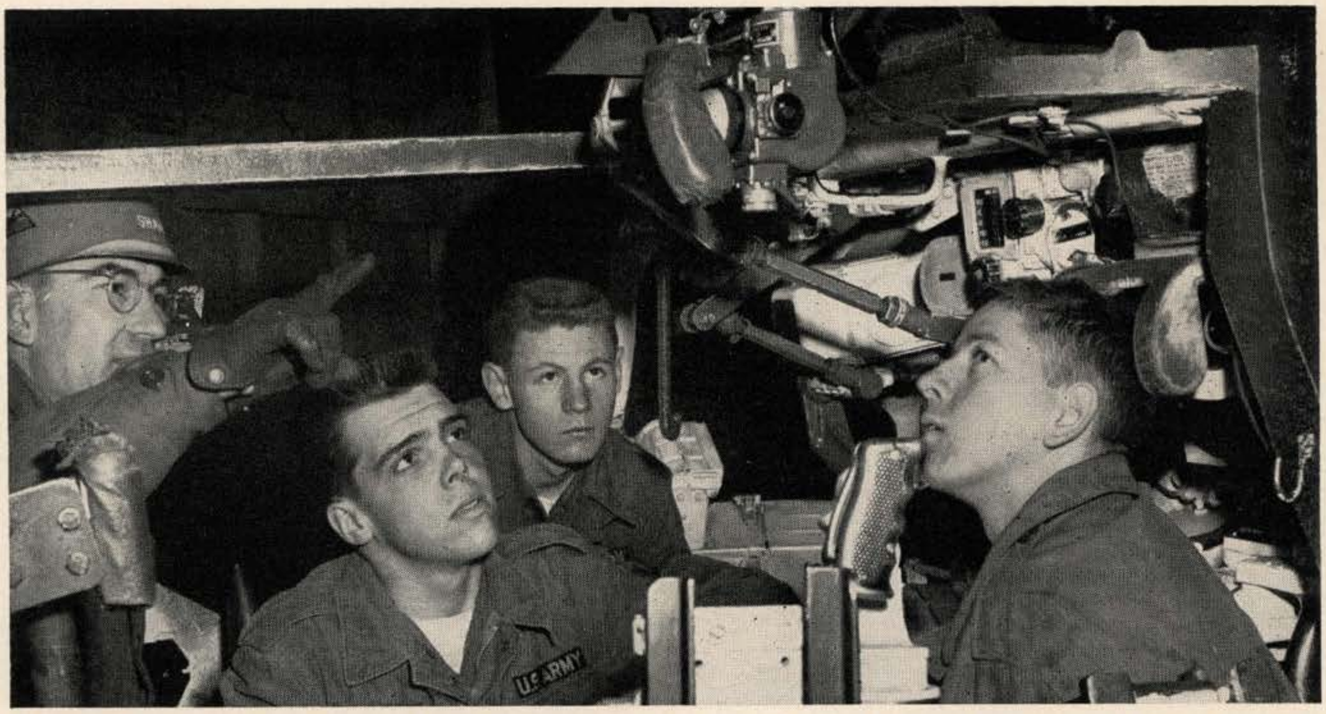
I volunteered for the RFA program for one reason: to keep myself out of the draft. When I had finished high school, I started making plans for the future. I knew that when the time came I would be in the active service for two years. I had completed one year of college when the RFA program was adopted. I knew right away that it was my chance to get my active service out of the way. After finishing my basic training at Fort Leonard Wood, Missouri, I was ordered to Fort Knox, Kentucky. My reception and orientation at Knox was quick and painless compared to my initial reception into the Army. The orientation was thorough. We new trainees received information about the facilities which were available to us at Fort Knox and the many other advantages which are ours for the asking.

When I joined my home unit, I was really choosing the type of advanced individual training I wanted to have. Armor individual advanced is a ten week program which covers everything that concerns tanks. The Army's method of training is thorough: instruction in class and then practical work out in the field. The most interesting part for me is the 90mm gun and the devices used to aim and fire it. I haven't started my 90mm gun firing yet, but I am looking forward to the day I get out on the range. There are so many things to learn about tanks. It doesn't seem possible to learn them all in such a short time.

When I came into the Army I didn't expect much as far as barracks and food go, but I was really surprised. The barracks that we moved into had been recently remodeled with automatically regulated gas heat, a ventilating system, lighting with an outlet at each bunk and, of all things,



A taste of how it feels to actually drive a tank comes to the trainee after many weeks of classroom instruction.



These RFA volunteer trainees are shown taking advanced individual armor training learning the basics of a tank.

a water cooler. The food that is served in the mess hall isn't like home, but it is certainly appetizing, nourishing and filling.

Whatever my needs, I can find just about anything I want on the Post. The PX has just about everything that I need. For entertainment there are movie shows, and the service clubs have programs set up for our entertainment. For those who are interested in sports there are the field houses where they can play their favorite games, and there are hobby shops for those who want to continue their hobbies.

The discipline that is enforced by the cadre isn't too strict. They try to keep us on our toes and awake in classes. The instructors who teach the numerous classes are the best. There is always someone from the instructor group who will answer any questions we may have or help us in any way he can. Their training aids aren't too elaborate, but they still get over what they want to teach.

There is one disadvantage for the Reservists in this program which I think should be changed. The National Guard members, who are in for the same length of time and take the same training, receive an additional thirty dollars a month. The extra money would help the Reservists just as much as it does the National Guard members.

In conclusion, I will say that if I had it to do over, I would volunteer for the RFA again. I don't know how the other RFA's feel, but there is an advantage for any young man in this program.

PVT. LARRY J. MURPHY

PVT. J. T. MURPHY

The writer of the following article enlisted in the Reserves in the 665th Field Artillery Battalion, East Orange, New Jersey. After one month's service he volunteered for the six-months' training program under RFA. He is presently assigned to Company C, 2d Armor Training Regiment, ARTC.

When I first heard of the Reserve Forces Act I could see no direct benefit to me in the program. However, when compared to two years under Selective Service, the program fitted into my plans for further education and I volunteered for the program and enlisted in a reserve unit at home.

Although the first few days of training here at Fort Knox—that is, processing, being assigned to a platoon, drawing clothing and equipment and orientation conferences were rather confusing, I find that the actual training in basic combat is not as hard as I expected it would be.

I really like dismounted drill and physical training and believe there should be more of both subjects in the schedule. Rifle marksmanship with the M1 rifle has been the most interesting thing so far. Our company was trained under a new experimental method, and we qualified 100 percent. I fired a record score of 205 to qualify as a sharpshooter. With only four weeks of basic combat training I find my physical endurance has improved amazingly. Being able to compete with the rest of the men in the company on better than even terms has raised my confidence in myself and I believe this has been the major benefit I have received so far.

Saturday morning inspections are

also a favorite of mine. Each one of us tries to outdo the other and the results are gratifying.

However, one thing I'll never get used to and that is getting up so early in the morning. Before I got into the Army many people told me stories of the discipline. After four weeks I have found one thing to be true; it isn't the Army—*it's the man.* Everything has a motive and only in the Army does one see that with discipline anything can be carried out better with a minimum loss of effort.

In the choice of clothing the Army "know how" again comes into play. The clothing I was issued is not merely for one situation or condition but for any or all. For example, my field jacket is semi-waterproof and could be worn in the rain as well as in the cold.

I know, as many of my buddies do, that the order of rank is very important in the Army, although my only close contact is with the cadre. If not for them, I would constantly be in a state of confusion. They help to clarify and teach me what I should know and understand.

I have a new-found confidence and pride in myself as well as the men about me. One time when we were marching, the guidon bearer fell out, and rather than see the guidon fall, one man ran up and carried the guidon the rest of the way.

We get plenty of appetizing food to eat, although, of course, it is not like home. The renovated barracks we are living in are comfortable and far superior to many others on the Post. Inside they look new and clean. The walls are a hard surfaced plywood and the floors are hardwood. The gas heat is automatically controlled. Water for shaving and showering is hot and ample.

Letter writing is my main occupation during off-duty time. I also take advantage of the movies, service clubs and libraries. The PX may not be a corner drugstore, but it does take care of most of my needs including sundaes and sodas.

All in all, I have no regrets for my decision and I hope more publicity is given to the program to convince others of its benefits.

Pvt. John T. Murphy

LT. COL. P. W. ALLEN

The writer of the following article entered on active duty in 1941. After a two-year tour with School Troops at Benning he was assigned to the Antilles. Returning Stateside he was on Reserve component duty. Next in Korea he served with KMAG including four months as Regimental Adviser to the 6th ROK Division. He returned to the States in 1953 as Training Battalion Commander. He is now the Commanding Officer, 12th Training Battalion, ARTC.

Common Specialists? Let's look at the 12th Battalion, which is a separate command under the ARTC. Its mission is unique in that it produces qualified specialists for assignment to other branches, as well as Armor. The battalion at present has schools for radio operators, clerk-typists, and in a few months it will resume the training of automotive maintenance helpers and add new courses for supply clerks and parts clerks. Based on Army-wide requirements, school inputs fluctuate and new specialist courses may be required on short notice. A Leader's Course and a Transitional Training Course are now being considered.

Students come from many sources. They are principally men from the pipeline who are sent here for advanced individual training. Also, a few RFA men are assigned. Quite a few specialists are being trained for the gyroscoping 3d Armored Division. To make variety complete, an occasional WAC shows up for the clerical course.

The battalion headquarters has the usual functions of other battalions in the ARTC. In addition it has summary court-martial jurisdiction, publishes its own training schedules, controls all Battalion training and processes security clearances for radio operator students. The diversified training which it conducts makes training supervision the number one task of the battalion headquarters.

The companies of the battalion are responsible for all training in general subjects and provide housekeeping for students as well as for instructors of the mated schools. Clerks, radio operators and the like are frequently thought of as a rather "unsoldierly" breed. This is far from true in the 12th Battalion where the motto is "soldiers first; specialists second." The training program is well sprinkled with physical training, dismounted drill, ceremonies, guard duty and inspections. To a great extent, the com-

Training completed—an ARTC packet platoon ready for assignment to a unit.

pany commanders exercise control through the use of selected students as class and squad leaders. This is quite a feat in companies that range from 200 to 400 men.

The School Commandants, operating directly under battalion, are responsible for the specialized training within their schools. Except for the radio operators course, which is 12 weeks in length, the courses are eight weeks in length, and new classes in all subjects are started weekly. The commandants have operational control of their instructors who are assigned to the corresponding housekeeping company for administrative economy. Each school has its own supply account and maintains academic records. Otherwise, the schools are treated as special staff sections of battalion headquarters. This type of organization is found to be very economical and effective without damaging the standards of either the companies or the schools. It permits close coordination of administrative and processing requirements so as to minimize interference with class attendance.

Constructive comment regarding the quality of specialists graduating from the battalion is solicited from supervisors who receive them. A questionnaire is put in the file of each graduate with a request that it be completed and returned by his supervisor after a period of observation. The questionnaire is primarily designed to bring out weaknesses which may be found in the qualifications of the individual. Questionnaire comments are considered in adjusting the program of instruction to meet changing trends. Therefore, it is to the advantage of all concerned to let the school know if its product does not fill the requirements. This is one way to help the factory keep in touch with the market.

From the foregoing, we find that the 12th Battalion's mission, while perhaps not in the glamorous category, is none the less decidedly essential. For today there is no place for an Army without fast communications, moving wheels and reliable records.

Lt. Col. Paul W. Allen

PVT. J. R. HASLIP, JR.

The writer of the following article entered the Army from his home town, Helena, Montana, in August 1955. He received his basic combat training at Fort Carson. He was sent to Fort Knox to receive Advanced Individual Training in Radio Communications where he is presently assigned to Company A, 12th Battalion, ARTC.

Having been recently graduated from college, I have taken an interest in the radio school as an institution of learning. I have evaluated, in my own mind, the instructors, material and the methods of presentation.

The radio school resembles a civilian school in many ways. The method of presenting the material, for example, is basically the same. The instructor follows a lesson plan from which he stresses the most important parts. Sidelights are frequently added for a change. In addition, a question and answer period follows during which the instructor questions the class on points of importance.

Some of the instructors are chosen from classes on the basis of their education and outstanding work in their class. Upon graduation and assignment to the school, they teach classes in which they have particularly excelled as a student.

The problems of students in the school are not too great. Because code is so important, we spend much of our time in the code room. There, students have mixed emotions. Sitting at the 5 words per minute table you can see the 18 WPM table. "Boy, have those guys got it good," you think. As you progress in speed you realize how right you were, but it takes a lot of hard work to get there. It is very depressing to miss passing a certain speed by 1 or 2 letters, especially when you know it so well. However, when you do pass, you have a sense of accomplishment, that is, until you hear the next higher speed.

Transmitting has problems of its own. At first you have trouble getting the dots and dashes close enough together to resemble a letter. As your speed increases to 18 WPM you have trouble keeping them far enough apart to be understood.

The two minute test on transmitting 16 and 18 WPM seems to be the hardest. After about a minute and a half of flawless transmitting, you begin to tell yourself how well you are doing when, bang . . . a mistake! We then must go back and transmit the last correct group. Sometimes you seem to go backward faster than forward.

Radio procedure seems to be dull at first; just learning message forms, memorizing prosigns and operating signals. Later, however, it seems to piece itself together. You begin to realize how important it is to understand these shortcuts. Although we, as operators, do not write the message ourselves, we must understand every part of it in order to do a more efficient job.

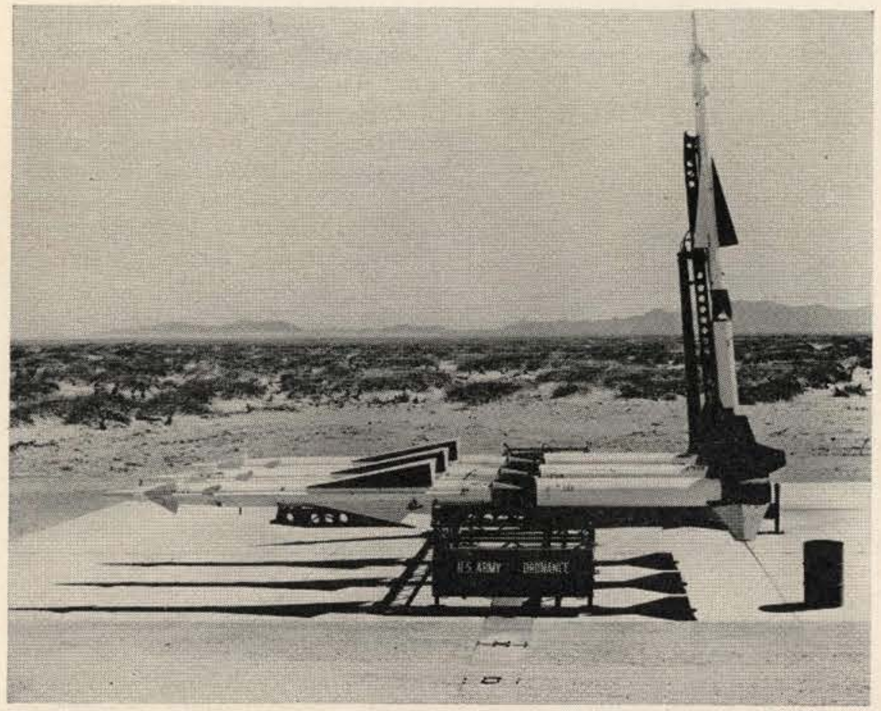
The class on field sets is the most enjoyable for most of us. We finally get out of the code room for actual operation of radios. Here, we put into use all we have learned in our classes. Nets are opened and messages are sent to other student stations. It is here that you realize the importance of good transmitting. Just one person who is poor in transmitting confuses the entire net, and time is lost when he has to repeat.

All in all, I feel that I was very fortunate in being selected for the Radio School. We do learn a lot and have fun doing it. Radio is interesting in itself, and the more you learn about it the more interesting it becomes. Many of us plan to become amateur radio operators after release from the service.

Most students, including myself, felt that because the Army causes an interruption in their plans and interests in civilian life, it can be looked upon as merely a waste of two years. However, when you have the chance to go to a school such as this one, you feel that your time can be spent actively and to your advantage while you're in the service.

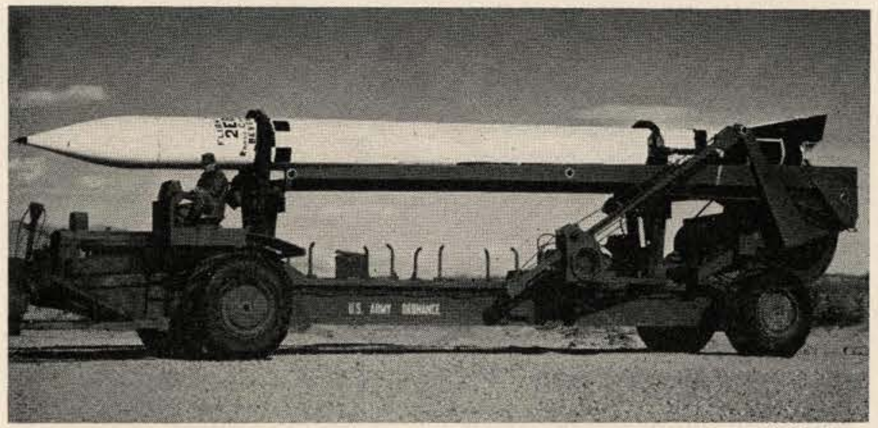
Pvt. James R. Haslip, Jr.

GUIDED MISSILES



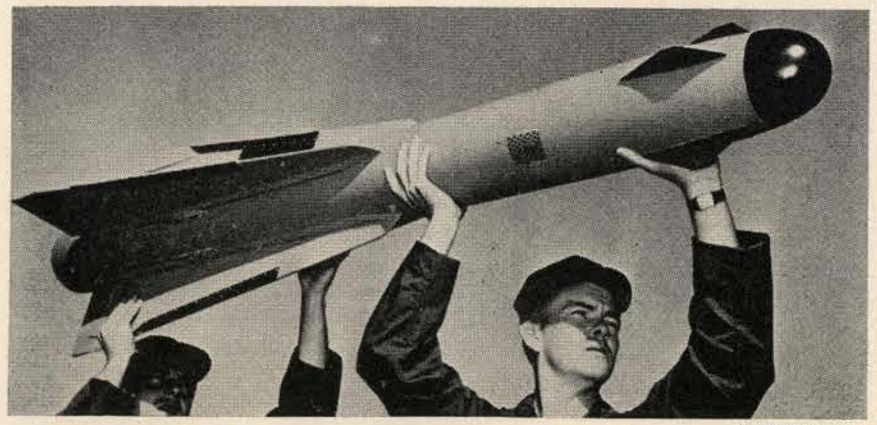
U. S. Army

The Nike is the first combat ready surface-to-air guided missile system to be put in use in the air defense system of the United States. It can locate and destroy enemy aircraft by an electronic "brain" regardless of evasive action.



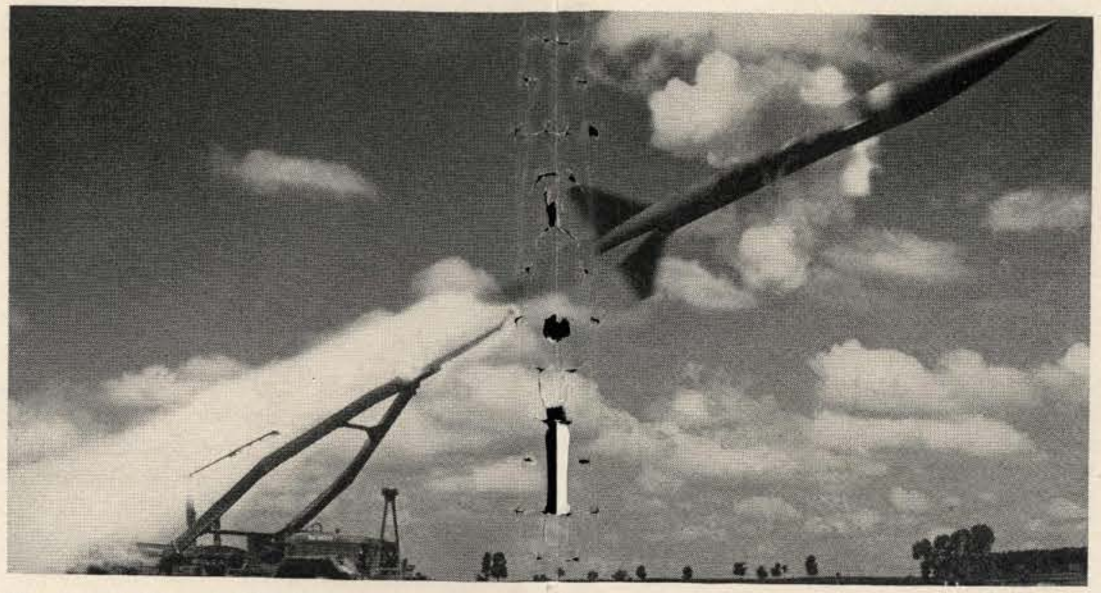
U. S. Army

The Corporal, a surface-to-surface missile, can be equipped with atomic or conventional warhead. It is designed for tactical targets beyond artillery range.



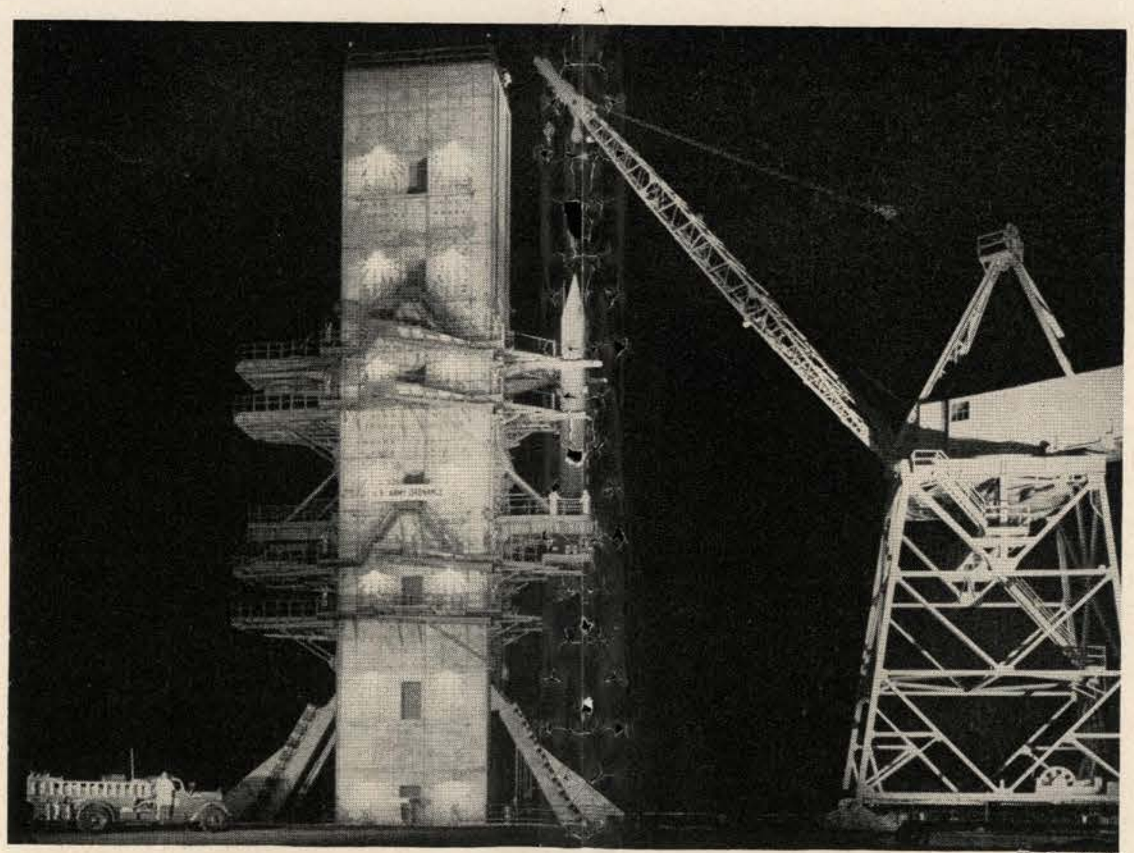
U. S. Air Force

The Falcon, a guided aircraft rocket, carries its own power plant and can reach supersonic speeds. Its guidance system can direct it to any maneuvering target.



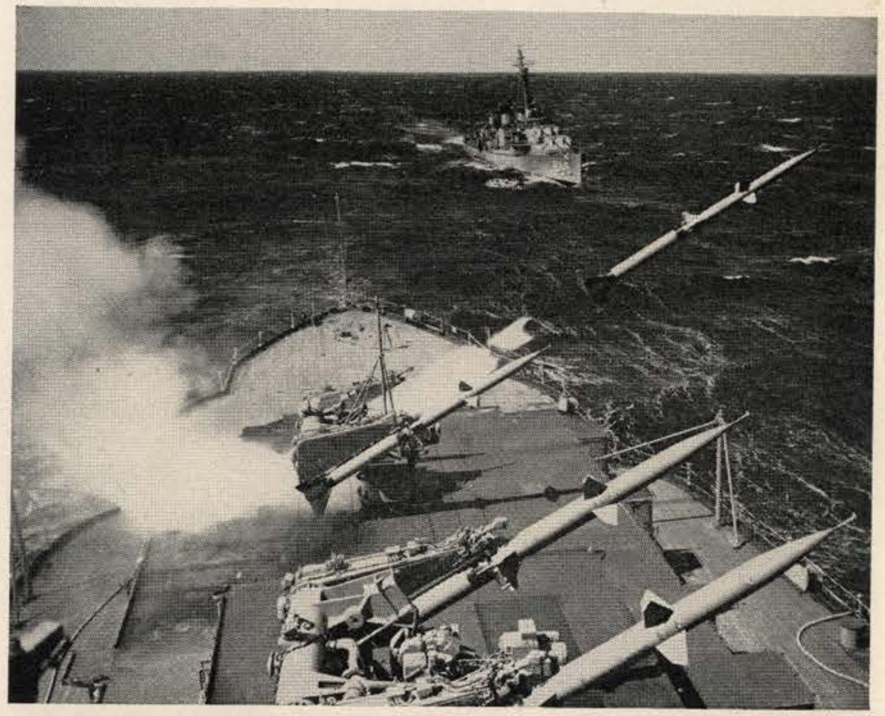
U. S. Army

The Army's Honest John is a free flight rocket, used in operations needing close ground support.



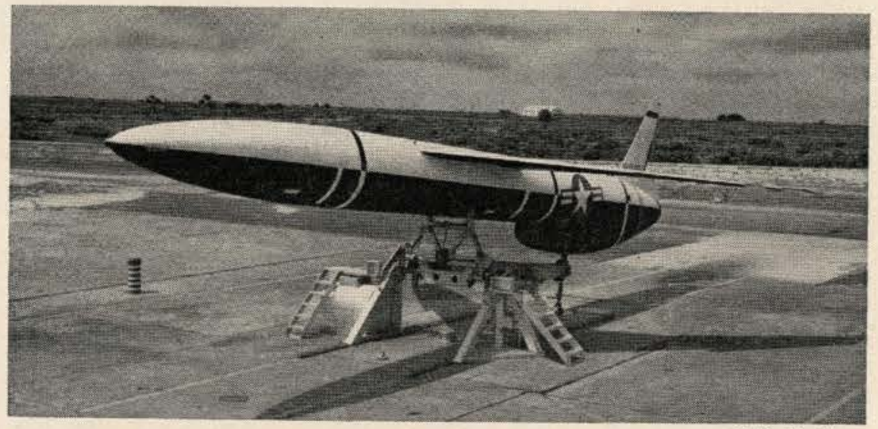
U. S. Army

This is the Army Ballistic Missile Agency's new static test stand. Shown under the glare of searchlights, it dwarfs the Redstone missile being lifted into place for a night test at the Redstone Arsenal.



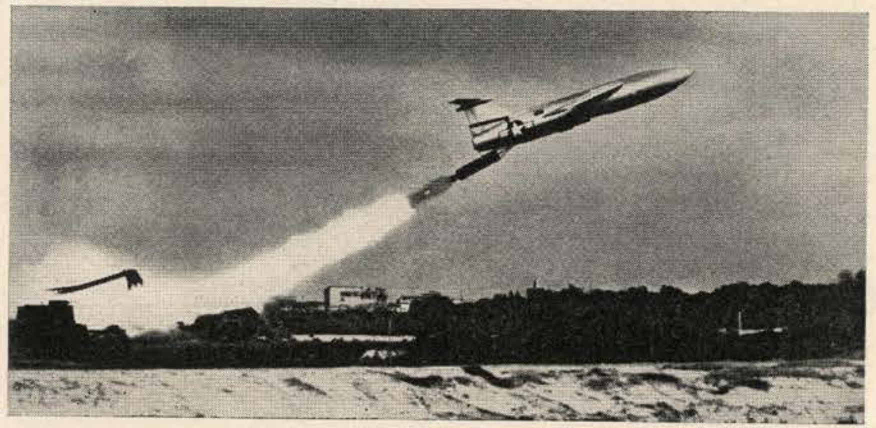
U. S. Navy

The Navy's supersonic antiaircraft guided missile "Terrier" can be launched from ground or ship to search out and destroy any type of attacking aircraft. It has a greater range and lethality than even the largest antiaircraft guns.



U. S. Air Force

First photograph of the Air Force Northrop SM-62 Snark long-range strategic missile which is undergoing tests at one of the Air Force's Missile Test Centers.



U. S. Air Force

The Air Force's first tactical, unmanned weapon, the Martin B-61 Matador pilotless bomber, does not need any permanent equipment at its launching site.

CHRISTIE

RENAULT

VICKERS

SHERMAN

CARDED

SCHNEIDER

TIGER

CENTAUR

CROMWELL

PATTON

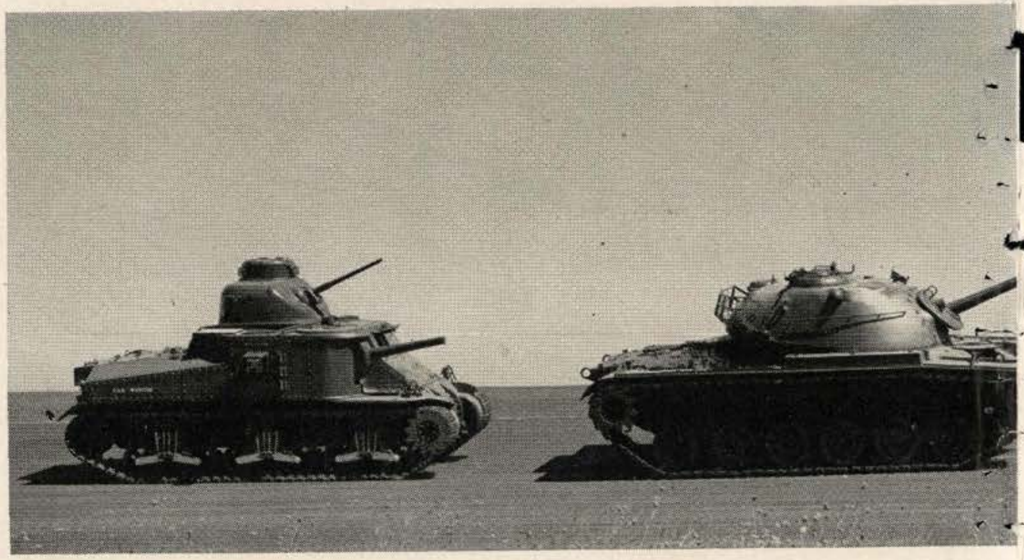
PANTHER

CHURCHILL

STALIN

BULLDOG

CRUSADER



SEVERAL years ago, *Collier's* carried an advertisement wherein Mr. Charles F. Kettering, one of the country's foremost research consultants, was asked in an interview, "What makes men successful? " His studied reply, in brief, was as follows:

First, develop the desire and ability to create ... something no one has ever done or been able to do before. Second, acquire the quality of persistence, the urge to keep going until a job is finished.... Third, be dissatisfied. This seems to be the standard equipment of successful men. Regardless of how outstanding their work appears to the world, they themselves are never satisfied and are sure if they had it to do over, they could have done a better job.... Successful men are never fooled by the limitations of the past, they know that new opportunities always lie ahead.

The philosophy expressed by Mr. Kettering is particularly adaptable to the military's continuing search for new and better ways of achieving rapid and decisive victory in war with only the absolute minimum in casualties. To the inquisitive mind, such a philosophy offers a logical basis for analysis in an attempt to find a better weapon, a better organization, and a better tactical doctrine. As Field Marshal Montgomery has said, "The key to our survival in a future war may well lie with the scientists. Military thought and tactical doctrine must always be well in advance of the times...." Faced as we are now with the awesome probability of atomic warfare, combined with the potential threat offered by the armed hordes of Communist China and the Soviet Union, preparedness for the present and the future is vital—we must search for weapons, equipment, organization, and tactical doctrine which will provide the greatest prospect of success if and when war should come.

Purpose

With the recently authorized significant increase in armored divisions, more interest in the past, present, and future of armor is being aroused. Such interest is beneficial not only to armor but to our military progress.

ARMOR

PAST, PRESENT AND FUTURE

U.S. Army Photos

By LIEUTENANT COLONEL MERLE L. CAREY

With Mr. Kettering's philosophy and Field Marshal Montgomery's thought in mind, the purpose of this article is to stimulate thought pertaining to armored tactics. To accomplish this, it seems wise to look first at some of the general lessons learned from our most recent wars, and then to establish basic assumptions on the use of atomic weapons. Such an attempt may enable us to better portray our weapon and equipment requirements to the scientist, and to design the organizations best suited to execute tactical concepts.

National Policy

Our current national policy indicates that we will not be the aggressor—the initiator of a future war. If and when World War III (or a lesser conflict) breaks out, the time, the place, and the first blow will be that of the enemy.

In none of the last three wars have we been faced with fighting over our own countryside or with the likelihood of destruction of our home populace and industry; nor have we been faced with the necessity for rapid entry into full-scale combat in an overseas theater. (Korea taught us some of the difficulties on a limited scale.) We have not been faced with having our troops disposed in an overseas theater in strength and in positions of almost immediate contact with a probable enemy force of greatly superior strength. The next time that ominous expression "total war" is sounded, we must be ready militarily as we have never been ready before if we are to be able to survive.

Assumptions

With these thoughts in mind, on what assumptions or guides shall we base our tactical concepts and planning for a future war? Strategic and tactical atomic war? Tactical atomic war? Nonatomic war? One approach to the question has been presented by Admiral Robert B. Carney:

> *If we are honest with ourselves, we will acknowledge that there are big wars, little wars, general wars, localized wars, Marquis of Queensbury wars, and savage, ruthless wars, atomic wars and, perhaps, nonatomic wars. What can we expect? What can we count on to guide us in our planning? . . . I cannot, nor can anyone else, forecast the blueprint. . . . Confronted with great uncertainty in this respect, I see no alternative but to hedge our strategic bets, ready to rush into the future, but also prepared to meet, and rely on, the methods of the recent past.*

In 1954 Mr. Hanson Baldwin, the reputable military analyst, likewise expressed the opinion that we should be prepared to fight with or without atomics.

Should our planning visualize only tactical employment of special purpose weapons? Is it more realistic to conjecture that the employment of atomics in either the tactical or the strategic sense will result in an all-out thermonuclear war? Another appropriate question is whether or not our allied forces are capable of defeating the Soviet Union or Communist

China without the tactical use of atomic weapons.

The "First Blueprint for Atomic War" for NATO forces is described in the 25 February 1955 issue of *U. S. News & World Report* by Robert Kleiman as follows:

NATO's powerful 400,000-man Army in central Europe has received a new directive—to stand and fight for West Germany, if Russia attacks, rather than retreat to the Rhine. This 'forward strategy' is the first result of a historic 14-nation decision to base all Western defense plans on tactical use of atomic weapons.... The old idea was based on the concept of a 'race to the Rhine.'... The new atomic strategy, in contrast, will see most of NATO's active divisions in Germany, five of them American, committed to battle immediately if Russia attacks. As soon as Soviet invaders lift the Iron Curtain, they will be met and engaged with atomic weapons at the very 'threshold' of West Germany.... New tactics, to go with the new strategy, are being developed.... The mission of NATO ground forces will be to employ conventional arms, terrain obstacles, maneuver, and stratagem with one overriding purpose: to locate and force Soviet troops into concentrated atomic targets.... Russia can only be defeated by employing from the start the superior United States nuclear stockpile.

This study by NATO, as reported by Mr. Kleiman:

... does not go beyond 1960. But it implies that security, after 1960, will depend on new 'retaliation' weapons now only in the development stage.

Another indication of our probable retaliatory use of special purpose weapons can be drawn from the warning allegedly issued to Communist China by our Secretary of State: that if war should be initiated by Communist China in the Pacific, the United States is capable of striking back with devastating and heretofore unequalled force.

In view of these attitudes, the only firm assumptions that we can make in regard to the use of atomics are as follows:

1. We must be prepared to fight under conditions of atomic warfare.
2. We must be prepared to defeat the enemy on the ground without atomic weapons.

In other words, our course must be as General Matthew B. Ridgway has said:

Because we value human life so highly, it is incumbent upon us to follow the course which, if war comes, will lead to the most rapid success, the lowest cost in human life and suffering....

The Tank

In World War I the tank was introduced as a new offensive means of overcoming strongly organized and static defenses. However, it was employed only as an infantry support weapon on shallow or limited objective attacks. Some of the limitations encountered include excessive mechanical failures, inexperienced tank crews and commanders, and apparent failure to appreciate the full potential of this new weapon by committing the tanks prematurely and piecemeal. Nevertheless, it must be remembered that tanks were a new development and there were "bugs" to be worked out; that they were lumbering armored caterpillars; that control, resupply, and maintenance presented difficult problems; that numerous trucks or armored infantry carriers were not available to enable following and supporting infantry to assist the tank force in exploiting local opportunities; and that commanders were generally *unfamiliar with the capabilities* of these new tanks.

Postwar Developments

Following World War I mobile-minded enthusiasts such as General Adna R. Chaffee, Jr., Colonel J. F. C. Fuller, B. H. Liddell Hart, and Lieutenant General Sir Giffard Le Q. Martel propounded theories on mobile warfare with armor. In spite of their protests, however, the development of tanks and tactical doctrine for armor suffered both in the United States and in France. Although the British had the foresight to appreciate the mobile concepts of these enthusiasts, they lacked the finances to produce tanks in adequate quantities. The German Army studied this new mobile concept and, under the tutelage of such forward thinkers as General Heinz Guderian, willingly adopted it and trained according to the theories of the British and manufactured tanks in quantity.

In this country we vacillated between the infantry-support role and the cavalry role for tanks until, finally, in 1935, the cavalry-role enthusiasts were authorized to organize the 7th Cavalry Brigade (Mechanized) at Fort Knox, Kentucky. Although the French organized armored divisions, they adhered rather closely to the infantry-support concept. The Soviets produced numerous tanks, but like the French, they adhered primarily to the infantry-support concept.

In short, between world wars, only Germany had the foresight to recognize the offensive and defensive potentials of the tank. From this foresight developed the blitzkrieg tactics of 1938 and the early 1940s—and the downfall of nations.

World War II

On 1 September 1939 Germany proved to the world that she had mastered the art of mobile tank-air warfare. With shattering rapidity, her Panzer divisions and Air Force annihilated Poland's 60 divisions. Then the Panzer divisions and Air Force turned west and overran the once mighty Army of France and the Maginot Line defenses. In this campaign it is of interest to note that the French concept of using tanks primarily in an infantry-support role hamstrung the valiant efforts of the piecemealed armored units to stop the German armor. Had the French armor been employed in mass, the German penetrations might have been contained or even destroyed. It is interesting to note that *France had more tanks than Germany at this time.*

On 22 June 1941 the German Army launched Operation *Barbarossa*—the invasion of the Soviet Union. By concentrating her Panzer groups against extremely deep objectives and taking advantage of surprise, Germany hoped to achieve a rapid and decisive victory against another numerically superior enemy. The armored spearheads were almost within sight of Moscow when the tide turned against the Germans. Contributing factors in Germany's defeat on the east front include the rigors of terrain and weather; the breakdown in tank replacements, partially the result of Allied bombings of factories and rail centers; the surprising capability of the Soviet Army to withdraw deeper and deeper into the Soviet Union, then to counter with large reserves; the failure of Germany to concentrate on Moscow as the vital objective; and the German failure to adopt a mobile defensive-offensive concept (when the Soviet Union took the offensive) rather than static measures to hold ground at all costs.

There were limitations and lessons to be learned from the North African and western European campaigns. The British proved the suitability of the mobile concept on the desert and the distinct advantages of armored troops over nonarmored in desert warfare. However, the most effective lessons on the desert were learned from Field Marshal Rommel and his *Afrika Korps*: the offensive potential of a small armored force and its adaptability to conduct retrograde, ambush, and defensive operations. In its initial actions on the desert, because of requirements imposed by higher commanders, our armor demonstrated the ineffectiveness of piecemeal commitment. Later, however, it demonstrated the capabilities of armor in mass by effecting its own penetration, then exploiting through the "mousetrap" in the race to Bizerte.

In western Europe, Allied armored divisions were generally employed according to the mobile concept until our logistical difficulties enabled the German Army to regain its balance. Various roles played by armored divisions in western Europe included the following: exploitation of carpet bombing; penetration of enemy defenses, followed by exploitation to a deep objective; exploitation of an infantry division's penetration; breakout from encirclement; pursuit and encirclement of a large enemy force; effective use of task forces of combat command size under the division's control; seizure of key bridges intact; encirclement of key communication centers; rapid concentration for defensive-offensive operations against a large enemy penetration; piecemeal attack against superior enemy forces; protection of an army flank; piecemeal counterattack by units of the division; aggressive defense against superior forces; and link-up with a large airborne effort. With only few exceptions—such as the race to the Seine, encirclement of the Ruhr, and encirclement of the Saar-Palatinate—there were two or three armored divisions employed in an "armored corps" type operation. In Operation *Market-Garden* a combination of mobile units—armor, airborne, and air—was employed to seize a decisive objective. Whereas the German Panzer divisions were badgered night and day by Allied air forces, our armor was relatively unhindered by enemy air. One technique we learned well was the employment of tactical air in support of ground operations. Another lesson was that a "continuous line" advance consumes a great deal of combat power. Additional lessons learned include the following: the advisability of substituting the tank for the tank destroyer as the best antitank means; the terrific clogging of roads; the overconcentration of troops involved in the passage of lines; the stunned effect on troops when confronted with superior armored threats; and the necessity for fighting with combined arms teams.

In Korea there were no armored division actions, although the North Korean 105th Armored Division worried many United Nations division G2s by its presence. However, there were tank battalions and regimental tank companies. The initial attack by the North Koreans was spearheaded by four battalions of Soviet *T-34* tanks which terrorized and overran the South Korean troops who had no tanks. When the United Nations introduced medium gun tanks and the enemy was unable to replace tank losses, the enemy tanks were no longer capable of dominating the action. It is worth noting that our fighter aircraft destroyed more enemy tanks than did our own tanks. With the exception of the initial attack and our breakout to the north, in conjunction with the Inchon landings, armor was reduced to an infantry-support role. Occasional armored raids and counterattacks were employed, but in a comparatively infantry type role.

Our tank limitations in Korea might be summarized as follows: unfavorable terrain and weather, initial lack of tank means, type of enemy action, frequent reluctance to commit tanks, mechanical unreliability and limited cross-country mobility of newer model tanks. Although mountainous, studded with rice paddies, and sadly lacking in highways, it might have been practicable to employ combat command size armored units. Likewise, one armored cavalry regiment with each corps, supplemented with horse cavalry in the hills, might have greatly relieved the infantryman of many punishing missions.

Present Tactical Doctrine

Within the framework of our present "type corps," as used for academic purposes, there are over 1,100 tanks. At first glance this might indicate that our type corps is actually an armored corps. However, this is not the case, for each of the three infantry divisions contains about 150 tanks; the armored cavalry regiment contains about 125; the armor group contains 200; and the armored division contains 350 tanks. Only in the armored division are tanks found in mass, with adequate armored infantry, artillery, and engineers, and the necessary combat support and logistical elements for sustained operations.

The armored cavalry regiment is principally employed for reconnaissance, security, and light combat missions. The armor group contains only tanks and is generally employed to reinforce the tank strength of divisions of the corps. The tank units of the infantry divisions are employed to support the nonarmored infantry. Consequently, of all the tank units presently found in the type corps, only the armored division is designed for employment in a truly mobile, sustained combat role.

Based upon its organizational characteristics of battlefield mobility, armor protection, extensive radio communications, heavy firepower, and flexibility, the armored division is presently considered to be well suited to execute missions such as exploitation, pursuit, covering force (in advance or in retrograde), counterattack, and mobile defense. On the other hand, although capable of accomplishing any reasonable ground mission, the armored division is considered less well suited to execute missions requiring either a penetration of an organized enemy position without use of atomics or a position defense. In brief, the present tactical doctrine on employment of the armored division visualizes mobility as the keynote.

Kurt Gilbert, a former member of the German Panzer force, draws the following appropriate conclusion from Germany's experiences with armor in World War II:

A certain school of thought sees the tank as an instrument to support *the infantry in attack and defense. Another sees it as a strategic weapon which, in the form of divisions or corps, fullfills in an offensive manner even defensive missions. Only this latter concept corresponds with the real nature of the tank; all the others rob it of its principal element: mobility.*

Likewise, Lieutenant General Sir Giffard Le Q. Martel, a foremost exponent of armor in England who fought against Field Marshal Rommel's Panzer division in 1940 at Arras and who headed the British military mission to the Soviet Union in 1943, had the following to say, in 1952, on armored warfare:

We went sadly astray in certain directions after World War II. We have seen that if we had built up a number of armored divisions instead of so many infantry divisions between the wars we might have stopped Hitler's rapid advance and saved France. This might well have halted the entire war. We made the same mistake again after the war. The only possible enemy was the Soviet Union, and she had great numbers of infantry divisions. It was not until much later that she was able to build up armored forces, and they are still very short of mechanical transport on which armored forces so largely depend.... We now realize the foolishness of trying to take on the Soviet masses in this way (with infantry). Instead, we are now concentrating on raising as many armored divisions as possible. ... It is becoming accepted that these divisions should be used in a highly mobile role to attack the enemy in flank and rear. They must use their mobility to avoid attacking strength. Mobility replaces strength and numbers. This is the way to take on the Soviet masses if war should arise ... mobile warfare could certainly be repeated today if the Western Nations had the necessary forces.

The Soviet Situation

It is well to look briefly at the Soviet situation with respect to strength and tactics. One thing is certain: the might of the Soviet Army must not be underestimated. However, the corollary is also true: we must not succumb to the theory that the Soviet Army is invincible. Still another corollary would appear to be a basic assumption: even without atomics or similar special purpose weapons, the Western allies are capable of defeating the Soviets. Consequently, our approach in analyzing our own weapons, organization, and doctrine should be based upon the realistic realization that war with the Soviet Union—and with Communist China—is possible, is seemingly probable, but not necessarily unavoidable.

The Soviet Army is now believed to include approximately 175 divisions, of which about 65 are either tank or mechanized. It is believed, however, that many of their rifle divisions are now being converted to mechanized divisions. Rifle divisions are being motorized. In addition, there are believed to be 80 satellite divisions.

It was estimated by Field Marshal Montgomery in his 24 May 1954 speech to correspondents that:

The USSR, Eastern Germany, and the East European satellites today have over 6 million men under arms. Approximately 4.5 million of these are in the ground forces. . . . The USSR has a readymade spearhead for a rapid advance into western Europe ... composed of 22 Soviet divisions in Eastern Germany, the bulk of these armored divisions.... Behind this spearhead there are an additional 60 Soviet divisions located in the eastern European satellite countries and western USSR. (This does not take into account satellite divisions.) . . . the Soviets have more than enough tanks, mortars, and antitank guns for about 300 Soviet divisions.

Soviet tactics derive from their generally accepted principles or "permanently operating factors" which are similar to our principles of war. In his book, *Soviet Military Doctrine*, Raymond L. Garthoff makes the following observation with respect to these permanently operating factors:

It is significant that these five (or six) factors are elevated to the importance ascribed, at least verbally, to them. The stress placed on the 'stability of the rear' may betray a Soviet fear of instability and unreliability in their own country. Together with the 'morale of the army' it indicates an acute awareness of the need to maintain strong morale both at the front and in the rear and at the same time to weaken the enemy's morale. . . . The interest in the 'quantity and quality of divisions' and in the 'armament of the army' indicates a high degree of concern for this material means of war (although recognized as essentially important in all armies, these factors are not usually considered basic principles of war). The stress placed on the 'organizing ability of the command personnel' is indicative of a special need for overcoming other deterrents to initiative and securing the organizing ability of officers.

Other principles of Soviet doctrine pointed out by Raymond Garthoff include "mandatory annihilation, determination of the direction of the main blow" which are somewhat foreign to us; and the offensive, concentration of force, maneuver, and cooperation or combined action.

The Future of Armor

Thus far we have looked at the potential enemy, some of the lessons learned from the past, and have made basic assumptions pertaining to atomics. With these in mind what, then, is the future of armor? In what roles can our armored divisions be cast effectively in the near future? What changes in organization and equipment seem warranted for the immediate future?

First, armor is our brightest ground star—particularly when teamed with air in a major theater of operations, as opposed to localized wars. Atomics are extremely important weapons; however, the late General George S. Patton, Jr. wrote of new weapons:

When Samson took the fresh jawbone of an ass and slew a thousand men therewith he probably started such a vogue for the weapon, especially among the Philistines, that for years no prudent donkey dared to bray. Yet, despite its initial popularity, it was discarded and now appears only as a barrage instrument for acrimonious debate.

It would seem that we cannot afford to go completely overboard on atomics. Additionally, if we employ atomics, the enemy retaliates with atomics, or vice versa. This again enhances the value of the armor protection, the mobility, and the radio communication available to armored units.

If atomics are used tactically, they should be exploited without delay. Again, the mobility of armor and its tremendous firepower are highly advantageous. On the other hand, if atomics are not employed it would seem that our hopes should rest in taking maximum advantage of mobility on the ground, in the air, and on the sea. In a general war, from analysis of the nature and strength of the probable enemy, the presently estimated tactical doctrine of this probable enemy, and the terrain in Europe (or China) over which future battles may occur, armor is vital for success in the immediate future. In a lesser theater of operations, such as localized wars, in all likelihood armor will play as vital a role as the terrain and the mobile-mindedness of our commanders will permit. Again the question of atomics arises and whatever the answer, we must be prepared.

In writing of "Infantry in Modern Battle," in 1954, General Sir Richard N. Gale had the following to say of the power of armor:

Memory is sometimes short and theory is sometimes sweet. A heavy tank still in action dominates the battlefield on that spot where it stands. A larger number of them merely extends the size of the spot. If the theorist tells you this is not so, disbelieve him.... Sufficient numbers of these heavy tanks, whose devastating fire can be supplemented by normal artillery, can provide enough cover to permit the remainder of the tanks to press their attack home. Tank strength is a factor in the conduct of modern battle which you cannot ignore. The correct handling of this potential force should dominate tactical thought.

Consequently, armor looms as our greatest potential for success. It can and will accomplish its assigned combat missions as successfully as we organize, equip, and train it. This requires continuing thought as to what missions are proper, what influences the probable terrain and enemy may exercise, and what organization and equipment we shall need to accomplish these missions against the likely enemy.

Future Employment Concepts

This article seeks to stimulate thinking on considerations about which too few really qualified experts have written. Because this article is unclassified, some of the important considerations and thoughts must necessarily be omitted. Nevertheless, the influences or concepts visualized herein are based on the over-all mission of armor, the probable enemy's situation, the probable terrain involved, the past limitations in employment of armor, our own present situation, and the assumption that we must be prepared to win the ground battle either with or without atomics.

1. It is visualized that the principal division in the immediate future will be the armored rather than the infantry division. Consequently, the armored division will no longer, as in World War II, enjoy the luxury of frequent reserve or rehabilitation periods. Rather, it must be prepared for sustained offensive, defensive, and retrograde employment.

2. It would appear that our "continuous line" advances of World War II are now obsolete. Instead, as visualized years ago by Marshal Saxe and more recently by the Fuller-Hart-Guderian advocates, several large armored formations will maneuver from infantry-antitank bases which will be held along mobile defense lines. Within the maneuvering elements of corps size, in all likelihood two armored divisions will advance abreast, followed and supported by the motorized infantry. The nature of this attack may initially see a continuing sequence of leapfrog actions wherein combat commands attack through, or around, each other to seize and secure relatively limited objectives. This would give depth or security to the attack against the deeply echeloned enemy position and reserves; and, particularly, this would maintain the momentum of the deep attack by commitment of fresh troops. By frequently employing airborne—parachutists, helicopter, and air-landed—troops, as a forward pass in football, the enemy defenses cannot concentrate against only the forward line, but will have to hold out strong reserves to meet the airborne assault or threat as well. Link-up distance should be based primarily upon a realistic appraisal of the time it will take the attacking armored divisions to reach the widely dispersed airhead; the ability of the enemy to react; and the strength, nature, and importance of the objective—all learned from the Arnhem operation of World War II.

Infantry divisions, which should retain their present organization essentially, will be employed primarily as follows in a general war: to hold these bases; to follow, support, and protect the flanks of the armored column; to clear built-up areas; to effect penetrations where terrain or fortifications render it more suitable; and to conduct generally limited offensives, particularly under night and adverse weather or terrain conditions. Of one thing we can be certain: the infantry division is a fine organization and, in the past, has been as flexible as its regimental and division commanders have permitted it to be. As such, in a localized war such as Korea or Indochina, it will again be the principal ground division and will perform as nobly as in the past. However, in a general war against the Soviet Union or Communist China under atomic warfare conditions—which will probably be adhered to whether or not the weapons are actually employed—it is believed that the armored division is better suited to serve as the principal ground division.

3. The "indirect approach" concept propounded by B. H. Liddell Hart warrants our close attention. Traditional avenues of approach to key objectives such as Berlin and Warsaw must be avoided. We can anticipate these avenues to be highly organized in depth. Instead, we must seek out the "Ardennes" type approach in order to achieve deviation and surprise by virtue of the unexpected direction of attack. This will enable us to take advantage of armor's capability to concentrate rapidly, and to gain the enemy's lucrative rear areas either by penetration through weaker defenses or by envelopment of strength. This will also enable us to entrap sizable enemy forces.

4. The calculated risk, the bold and aggressive spirit, and the initiative of subordinate commanders should be taught and fostered. The "time compression" and "absorptive power" referred to in the NATO New Approach (described in *U. S. News & World Report*, of 25 February 1955) will require mission type orders, rapid reaction to changes in the situation, acting on oral orders, and the spirit and initiative to keep on fighting even under extremely adverse conditions.

If atomics are employed, the close combat job on the ground will be just as rugged. Just as the Soviet Army trains its armored and horse cavalry units, the allies must train their armored, infantry, and airborne divisions—emphasizing the calculated risk, and bold and aggressive tactics. To achieve this goal, our senior tactical commanders must appreciate the mobile-minded approach employed by Generals Patton, Stuart, and Sheridan. Our senior armored commanders also should be given the opportunity to maneuver large armored units to acquire what B. H. Liddell Hart calls the art of "tank warfare" as the Germans acquired it—prior to battle.

5. In addition to the offensive roles now emphasized for the armored division, it is visualized that the following will not be unusual: penetration of enemy defenses, with or without atomics, and assault river crossings. The ability to concentrate rapidly, with armor protection, and to move rapidly into the attack warrants employment of the armored division in this penetration role, particularly if atomics are used to breach enemy defenses. This enables the armor to take immediate advantage of the breakthrough, and facilitates or eliminates the passage of lines. Likewise, armor should be equipped to give the breakthrough more versatility tank-wise with respect to river obstacles, in order to enable the division to exploit the advantages accruing to the attacker. At present, the *M59* armored infantry vehicles enable the armored infantry to swim major rivers. Tanks might also be given this capability.

In addition to these two roles previously discussed, it may be that armored divisions, equipped with lightly armored amphibious vehicles, can be employed as the leading elements in amphibious operations. Armor is appropriate wherever we can accomplish the job faster and save lives by ground mobility and armor protection.

6. Tanks will be employed in mass, not piecemeal. Against a potential enemy such as the Soviet Army, tank losses initially can be expected to be sizable. Large stocks of tanks and ample replacement crews must be available without great delay. To locate tanks in needless quantity in other than the armored divisions seems economically wasteful and tactically unsound. It would seem that only the minimum number of tanks should be allocated to the infantry division to provide it antitank and tank-support means. The World War II tank battles of North Africa and eastern Europe are indicative of future tank battles with or without atomic weapons. Field Marshal Rommel taught us the value of maneuvering tanks in mass for decisive tactical success. Guderian and others point out the results suffered by the German Panzer units when replacement tanks were no longer available in quantity.

7. Our tactical operations initially will be opposed by massed enemy aircraft. For this reason it will be particularly important to emphasize again all aspects of troop movements and air defense measures to armored units. The movement of armor over main and secondary roads to assembly areas under night conditions; the passage of armor through infantry units or avoiding such passage where practicable; the early cross-country deployment of units in the attack; the maximum use of cover and concealment; the circumvention of bottlenecks—these and similar measures will, in all likelihood, be particularly important if we base our thinking upon the lessons of the past and the probable enemy air strength. Our development of tactics and techniques should not overlook these considerations. Column-cover aircraft may not be available in the early stages until our Air Force can gain control of the air. Likewise, antiaircraft with the combat elements can serve only as a deterrent measure. Supply convoys will be harried, delayed, destroyed, or forced off the roads. Time and space considerations will bear greater attention both in training and in combat execution. In short, we must be prepared to fight armor effectively in the face of superior enemy air.

8. The armored division frequently will be required to fight retrograde operations. In his article, "Decision in the Face of Defeat" (*Military Review*, March 1955), Colonel Alexander D. Surles has realistically portrayed the need for basic changes in doctrine. In the past we have been woefully lacking in our training and in our emphasis on retrograde operations. Against the Soviets or the Chinese Communists, we could find it extremely worthwhile to have adopted Colonel Surles' proposals on retrograde. In furtherance of his comments, how many unit training hours are devoted to retrograde? How many hours do our service schools devote to retrograde? Again, not enough. The subject card files or catalogues in our libraries reflect the general lack of interest of American military writings in retrograde. However, the German Army—and it could never have been accused of being defensive minded—placed primary emphasis on retrograde in training prior to World War II.

Because of its mobility and armor-protected firepower, the armored division is better suited than the infantry division to fight a delaying action or cover the withdrawal of a larger unit. To accomplish this covering or delaying action, the division trades minimum space for maximum time, avoids decisive engagement, and maintains contact with and inflicts maximum punishment on the advancing enemy. In the past our delaying or covering force doctrine has prescribed a light line of delaying troops to cover avenues of approach and that withdrawal from one position to the next should be effected during darkness if possible. Based on past Soviet tactics against the withdrawing German forces (in addition to the measures indicated by Colonel Surles), it is visualized that the division may have to deploy in somewhat greater depth and give greater attention to security on the flanks.

By virtue of its cross-country mobility and its type of firepower, armor is well suited to effect its withdrawals in dispersed formation during daylight, accomplishing its delay between, as well as along, defensive positions. Another consideration for armor in delay is the ambush, employed to destroy and slow down an impetuous enemy. Field Marshal Rommel taught the value of luring enemy tanks into a trap. We will do well to learn this technique and to combine it with atomic weapons, if used.

9. In its mobile defense, armor must solve the problem presented by the Soviets' and Chinese liking for and skill in infiltration. The Germans learned that every Soviet bridgehead or advanced unit within their "lines" had to be attacked and destroyed immediately. Otherwise, with their ability to infiltrate farther and then disappear into the ground, they built up strength and were difficult to handle.

Another tactical trait of the probable enemy is his fondness for seizing high ground whether of tactical value or not, although repeated attacks throughout the night were required. Likewise, the Soviets thought little in the past of repeating an attack three or four times at the same place and in the same way even when they were repulsed with tremendous losses. Consequently, it would seem that solutions to some of the following problems may be particularly important to successful mobile defense: devices to maintain contact with the enemy in gaps—through sound, sight, or light; patrols; preparation of alternate strong-point positions for occupation during darkness; assurance of communication laterally as well as in depth; rapid employment of local reserves to destroy small groups; ambush tactics; avoidance of overextension; and rolling with the blow.

In general, it seems that our mobile defense concept is sound and workable. General Claude Auchinleck devised the "chequer of localities" defense on the desert as a means of meeting the *Afrika Korps* attack and then countering heavily with armor against Field Marshal Rommel's flank and rear. Our mobile defense is likewise intended to capitalize on mobility, to destroy the enemy.

10. The development of tactical doctrine for armor should not overlook the alleged weaknesses evidenced by the probable enemy's permanently operating principles. For example: deep armored or airborne thrusts into his rear areas, to play upon his alleged unstability; by capitalizing on the lack of initiative permitted the subordinate commanders; or through analysis of his set patterns on preparations for an attack, to withdraw to flank or rear positions, then ambush or counterattack the attacker.

In the development of future doctrine, we must not approach it by studying only the narrow front offered by one particular theater of operations. For example, we should not be unduly impressed with the importance of the defense by studying only World War I and Korea; nor with the overpowering offense by studying only the Civil War and World War II. We should persistently attempt to avoid past limitations and thereby do our job better than it has been done heretofore.

Changes

What changes in organization and equipment are warranted for the immediate future? Consideration of changes deemed advisable involves going from the broad brush, at corps level, to the fine-line pen stroke—the individual tank. The foremost change would involve the redistribution of tanks to accomplish a more desirable ratio of mobile, armored combined-arms teams and less dissipation of the tank effort throughout the "type corps."

To accomplish this the infantry division should lose its regimental tank companies, but retain one medium or heavy-gun tank battalion of four lettered companies, with approximately 70 tanks, to provide it with effective antitank, offensive combat power and counterattack mobility. The armored cavalry regiment should remain essentially as constituted, with respect to light and medium-gun tanks. The armor group should be eliminated. This would then permit a saving of almost 300 tanks for each corps—which would almost equip another armored division. Therefore, the result of this redistribution would be to provide for greater concentration of tank effort; to provide for greater mobile combat power for decisive results; and to provide for the additional armored divisions required for several armored corps, each to consist of two armored divisions and one partially mechanized—partially motorized infantry division.

Within the armored division proper, the major changes deemed advisable include the following: those truly essential supply and service trains should be equipped with lightly armored vehicles capable of cross-country mobility and with a helicopter transportation unit; the ratio of combat to noncombat troops should be increased, by elimination of administrative and logistical personnel where at all practicable; the heavy-gun tank battalion should be changed to include four lettered companies; the fuel consumption and the cross-country mobility of the tanks and other armored vehicles should be greatly improved, particularly with a view to full-scale operations over muddy or frozen terrain; the main armament of the tank must be made as potent as science and a weight limitation of approximately 45 tons will permit but the human element of the crew inside the fighting compartment and its battlefield maneuverability must not be overlooked; simplicity, necessity, durability, and "maintainability" should keynote accessories, with a view to elimination of gadgets and overly complicated mechanisms from tanks; greater mechanical reliability is required to eliminate necessity for frequent reserve maintenance periods; and communications for armor must be kept simple, must be reliable mechanically and easily repaired or replaced, and must provide the large number of channels required for efficient control of deployed units.

Summary

In conclusion it would appear that our fundamentals are sound. The thoughts proposed here do not foresee the necessity for changing fundamentals. They do visualize the advisability of placing greater emphasis on some fundamentals and less emphasis on others in order to stimulate our thinking on armor in future war. This will assist in preparing us for that day—should it come—when armor will prove that it can cross the Steppes of the Soviet Union or the plains of Communist China.

In 1932, in his *Lectures on F. S. R. III*, Major General J. F. C. Fuller wrote what we have adopted as our summation in the following:

For many years now I have urged that general tactical training for war demands two books, one dealing with present-day warfare, and the other with future warfare. I have suggested this time and again, because we are living in a transitional military age, and were war to break out tomorrow, unless we have carefully thought out future possibilities, however full our knowledge of actualities may be, we shall be most indifferently prepared to wage it. . . . Adherence to dogmas has destroyed more armies and lost more battles and lives than any other cause in war.

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This article appeared in the December 1955 issue of the *Military Review* and is reprinted with the kind permission of its Editor. Photos are supplied by ARMOR.

LIEUTENANT COLONEL MERLE L. CAREY, a 1943 USMA graduate, served in Europe during World War II with the 12th Armored Division. Subsequent to the War he was an instructor at TAS. He next served in Korea, commanding a Tank Battalion during hostilities. Prior to his present assignment he attended C&GSC and served there as an instructor. He is presently an instructor of History of Military Art at USMA.

The Annual Report of the Secretary-Treasurer-Editor

To the Members of the United States Armor Association:

Submitted herewith is the report of the Secretary-Treasurer-Editor covering the general affairs of the Armor Association for the year 1955.

The Association

The past year saw a continued emphasis on Armor, hence the Association maintained its place in the spotlight pertaining to military affairs. The 66th Annual Meeting was held at Fort Knox on 28-29 January. At this meeting General Williston B. Palmer, Vice Chief of Staff of the Army, was elected to the Presidency. He also honored us by delivering the principal address, in the absence of the Honorable Hugh M. Milton II, Assistant Secretary of the Army, who was unable to be with us due to urgent business in Washington.

As in the past, the meeting served as the impetus for a year replete with activity in the mobile field. Thus, the Association, whose primary interest denotes mobility, got off to a running start.

FINANCIAL REPORT

of

THE UNITED STATES ARMOR ASSOCIATION

For the Year Ending 31 December 1955

CASH RECEIPTS & EXPENDITURES

Department	*Receipts*	*Expenditures*
ARMOR Magazine	$30,816.58	$18,618.69
Book Department	4,091.88	2,917.23
Income from Investments	287.08	
District of Columbia Sales Tax	2.69	2.27
District of Columbia Personal Prop. Tax		66.25
Bank Credits and Charges	.51	.70
Postage		1,072.47
Office Supplies	24.35	295.03
Stationery & Printing		361.52
Telephone & Telegraph	4.97	306.19
Machinery & Equipment	40.00	615.82
Maintenance & Repairs (Equipment)		30.65
Rent		1,980.00
Janitor Service		180.00
Travel Allowances		1,055.00
Travel Expense		40.78
Express Charges		27.72
Council & Editor Expense		229.45
Fire Insurance		29.75
Contribution & Flowers		40.20
Memorial Plaque (Cavalry)	309.00	348.50
Royalty on Book	100.00	
U. S. Government Bonds Purchased		5,000.00
Miscellaneous		40.00
SUB-TOTALS	$35,677.06	$33,258.22
Bank Balance (1 January 1955)	678.61	
Bank Balance (31 December 1955)		3,097.45
TOTALS—RECEIPTS & EXPENDITURES	$36,355.67	$36,355.67

NET WORTH—December 31, 1954 .... $12,041.45

NET WORTH—December 31, 1955 .... 19,008.34

Total receipts for the year were more than $35,000.00. Receipts for both *ARMOR* magazine and books were larger than the previous year.

Three council meetings were held during the year, the first one at Fort Knox on the 29th of January. At this meeting it was approved to investigate the status of the Draper Fund and to inquire into the feasibility of establishing some type award for outstanding Armored units. Approval was given the Secretary to award one-year honorary memberships to the cadets choosing Armor as their branch graduating from the Military Academy in June 1955. Also the awards to the ROTC institutions were approved. A new proposal was made to the Council, through the Secretary, by Colonel James H. Polk wherein it was asked to consider the erection of a memorial plaque at Carlisle Barracks, Pennsylvania in commemoration of the establishment of the first school of the mobile arm at that post. This was approved with the stipulation that the Secretary contact the heir units and ask them to contribute toward this worthy cause.

The second council meeting was held on 3 June. At this time plans for the 67th Annual Meeting were initiated. Committees were appointed to determine site, dates and program. The Secretary was given permission to purchase a fire-proof safe for protection of the master file of the journals. Awards and letters of welcome to the OCS graduates choosing Armor for their branch were established. Sets of Armor insignia and letters from the Association were given to each graduate from Fort Benning.

The third meeting was held on 2 December. At this time plans were firmed up for the 67th Annual Meeting. Several sites had been selected in order that we could broaden our base. However, due to changes in unit locations and other factors, it was determined that we would return home again in 1956 to Fort Knox. Committees were appointed to handle the nominations and program. The auditing committee was appointed. In the past the yearly report has been read at the annual meeting which has been customarily held in January. However, now that the meeting is held later in the Spring, the council approved the suggestion to have it approved by the auditing committee. Hence, the report is published prior to the meeting and you are reading it now. A building committee was appointed to investigate the feasibility in purchasing a building for permanent headquarters for the Association.

The Council Advisory Boards continued their fine support by keeping the Association abreast of activities in their respective theaters, encouraging memberships and submission of worthwhile articles for publication in the magazine.

The memorial plaque was unveiled in October and gift cards for gift memberships or books were made available for use of all members. Membership cards were being printed at the end of the year and will be issued with notices of the coming Annual Meeting.

The Magazine

Five issues contained 64 pages and one 68 during the year 1955.

The editorial policy continued on its special theme of stressing mobile warfare. However, emphasis was given to many military subjects such as leadership, military history and training which tend to provoke thought among the members.

In January, many bulk subscriptions were dropped owing to decrease in funds for periodicals. However, because of the increased interest in Armor, that is, six National Guard Armored Divisions by the end of the year, paid memberships were approximately at the same level as they were at the start of 1955.

The Book Department

Book department receipts were considerably higher than a year ago. The policy of continuing to advertise worthwhile books on a gratis basis was continued throughout the year. These books are selected to assist the reader in his pursuit of his endeavors in the military field.

Among the top sellers for the year were: *Portrait of Patton, Strategy, Preparation for Leadership in America* and *Panzer Leader*.

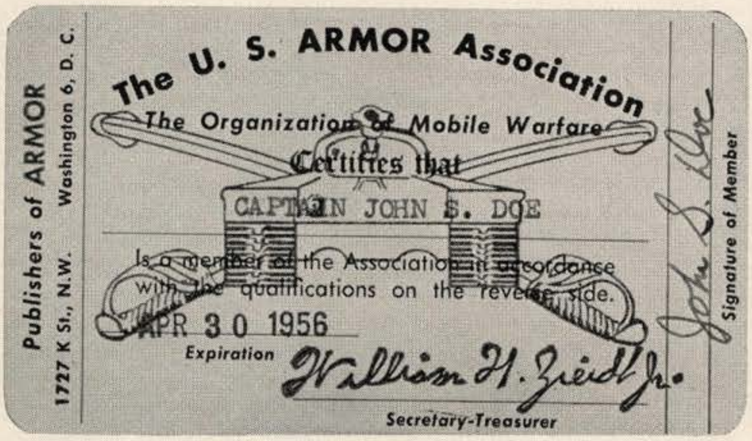
Binders continued to be a popular item, again stressing the value of *ARMOR* as a permanent reference for Armor officers, enlisted men and units.

Summary

These highlights serve to inform us that the year 1955 has been good, and lead us to believe that we are continuing on a firm basis. Increase in memberships leads us to the conclusion that we are assisting our members in the Regular Establishment and the Reserve Components. Continuation in encouraging all Armored officers to join our ranks is an appeal to keep us growing commensurate with our standing in the military profession. The value in the context of the magazine as an adjunct to training attests to the policy of encouraging all unit commanders to subscribe for dayroom copies for the use of their key noncommissioned officers. Encouraging of submission of articles for possible publication is a must to keeping our Association moving in the right direction. To disseminate this material is our aim. To better do our job we need more material from our members and others interested in the mobile field.

MEMBERSHIP CARDS

Notices announcing the dates of the 67th Annual Meeting have been mailed to all members. Included with the notices you will find two cards. One card is a return postcard for your use in notifying us of your intentions concerning attendance at the meeting. Also we have put your Addressograph plate on this card so that you can check the correctness on your mailing address. The second card is your membership card. We have received many requests for these cards and hope that they will serve the purpose. We have reproduced a facsimile of the front and rear of the card. You will notice that the front has a place for your signature. Please sign it before you insert it in your wallet. On the rear we have delineated various types of memberships for your convenience.

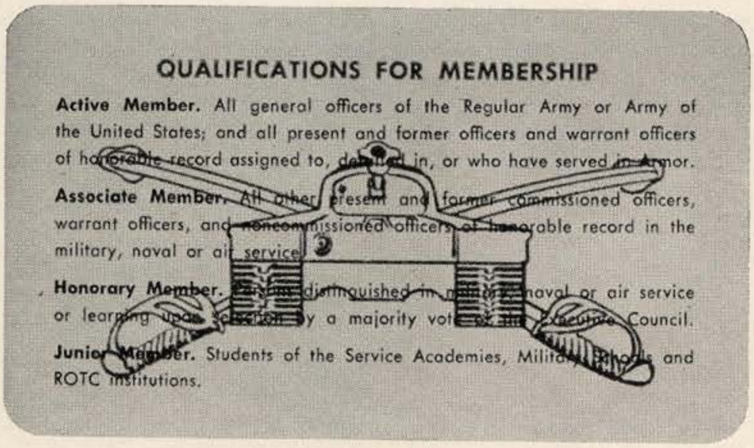


Publishers of ARMOR
1727 K St., N.W. Washington 6, D. C.

The U. S. ARMOR Association
The Organization of Mobile Warfare
Certifies that
CAPTAIN JOHN S. DOE
Is a member of the Association in accordance with the qualifications on the reverse side.
APR 30 1956
Expiration
William H. Zierdt Jr.
Secretary-Treasurer

John S. Doe
Signature of Member

Front



QUALIFICATIONS FOR MEMBERSHIP

Active Member. All general officers of the Regular Army or Army of the United States; and all present and former officers and warrant officers of honorable record assigned to, detailed in, or who have served in Armor.

Associate Member. All other present and former commissioned officers, warrant officers, and noncommissioned officers of honorable record in the military, naval or air service.

Honorary Member. Persons distinguished in military, naval or air service or learning upon selection by a majority vote of the Executive Council.

Junior Member. Students of the Service Academies, Military Schools and ROTC institutions.

Rear

Establishment of the Armor Leadership Award serves as an incentive for tank platoon leaders. It is hoped that institution of this award is the forerunner for other similar trophies.

THE ARMOR LEADERSHIP AWARD

By LIEUTENANT COLONEL GEORGE A. LUCEY

RECENT publication of Army Regulation Number 672-73 dated 15 December 1955 has aroused interest throughout the Armor Branch.

The Leadership Award announced by the regulation actually was established for the Cavalry branch some thirty years ago by Colonel Wickliffe P. Draper who was greatly interested in the training and development of small units and their leaders. Funds for the original awards were made available annually to the Chief of Cavalry in increments of $1,000.00 from 1925 through 1929.

After being informed of the methods and results of the testing for these years, the donor was so pleased that he sought and received permission to establish an Indenture of Trust which would assure perpetuation of the award. Necessary action was taken and a trust of $35,000.00 was established with the First National Bank of Boston as the Trustee. Terms of the trust were very broad and allowed for the accrued interest to be used in various methods for the promotion of small unit competition.

It was evident that the originator of the trust had considerable foresight, because the indenture covered any circumstances that might arise if Cavalry was discontinued as a branch. Additional provision was made for the inclusion of Reserve Components within the scope of expenditures from the fund.

The usual method of competition in the early days of the award was for the Chief of Cavalry, whenever possible, to have competition conducted on each post where Cavalry was stationed and then, providing distance was not too great, to have the winning platoons from each station compete with each other.

As income accrued from the fund it was possible to establish more than one award annually and in cases where inter-regiment competition was not possible, duplicate awards were made.

In the 1930's, awards were made annually on a separate basis to Cavalry Reserve and National Guard units.

In the days of prewar competition the prize awards to participants consisted of an individual trophy for the platoon leader and cash for the enlisted personnel with the platoon sergeants receiving twenty-five dollars and other members from fifteen to twenty dollars each. The competition was keen and individual soldiers showed great interest because the amount of money they received was practically equivalent to a month's pay.

During 1939, the Cavalry leadership test was adapted to Armored Cavalry technique and a separate competition for the horse and mechanized Cavalry was conducted. General Adna Chaffee was pleased with the test from the mechanized Cavalry standpoint and commented favorably to the Chief of Cavalry concerning the results gained from it.

Several present day leaders in Armor have won the Cavalry Leadership Award as 2d and 1st Lieutenant platoon leaders, with one officer, Brigadier General Philip H. Bethune, having won it while assigned to both horse and mechanized Cavalry units.

With the advent of World War II, annual competition for the leadership award became impractical and after 1940 the tests were discontinued. No attempt was made during the war to conduct any competition, due to wide dispersion of units and an accelerated mobilization program which caused frequent personnel changes. For the duration of hostilities the income derived from the trust was held by the United States Cavalry Association and the trustee. At the conclusion of hostilities the Secretary of War authorized the payment of accrued interest to the Commanding General, Army Ground Forces for future use. This occurred in September of 1946.

After receiving the fund, General Jacob L. Devers, Commanding General, Army Ground Forces, appointed a council for the purpose of making recommendations and suggestions for reviving competition in accordance with the trust. In November of that year, after review by the donor, the approved recommendations were implemented and the Armored Cavalry Leadership Test was established. At that time, Colonel Draper stipulated that his name would not be used in connection with the competition or award.

Competition was conducted during 1947 among Armored Cavalry units and three platoons were awarded trophies both for the parent unit and

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LIEUTENANT COLONEL GEORGE A. LUCEY, Armor, graduated from Norwich University in 1938. During World War II he served in Europe with the 1st Armored Division. Following the War he served in the Constabulary. Returning Stateside, he served on Reserve Component duty in New Jersey. After attending The Armored School he was assigned to the United States Forces in Austria. He is presently with the Armor Section, CONARC, Fort Monroe.

the individual members. During 1948, the council approved a plan to forward sufficient funds to the Constabulary in Germany for procurement and award of trophies. Unfortunately, at this time the Constabulary was in the process of converting several squadrons to Armored Cavalry Battalions and was not able to conduct any competition until early 1949.

One proviso of the trust authorized awards to individuals if the administrator so desired. In accordance with this authority, certain funds were made available during this period for use by the Commandant of The Armored School for individual presentation to outstanding students in various courses pertaining to leadership. These awards encompassed both officer and enlisted courses.

At the same time sufficient grant was made to the Commanding General, Far East Command, for purchasing and awarding trophies to units and individuals of Cavalry, Armored Cavalry, Tank and Reconnaissance elements of that command.

The 2d Armored Division and the 3d Armored Cavalry Regiment conducted separate competitive tests during the year 1950 with suitable awards being presented to the winning units and individual participants.

The council had provided for funds to be made available for prizes for platoons of the Tank and Reconnaissance units of the 2d and 3d Infantry Division and the 11th and 82d Airborne Division for 1951 and 1952; however the Korean situation prevented any such competition being held. In lieu of this, the Commanding General, Caribbean Command and the Commanding Officer, School Troops, Fort Knox, Kentucky, were allocated funds to conduct competition during this period. The testing was conducted within Armored Cavalry units and suitable trophies were awarded.

During 1951, the overall plan pertaining to the Leadership Fund received considerable study by Headquarters, Army Field Forces, and emphasis was directed toward the goal of providing a long range program which would insure maximum continuity of competition for the award on a world-wide basis. The old idea of the cash awards was tentatively discarded because of the increased pay scale within the Army, and a proposed idea of having a large master trophy supplemented with a unit trophy for retention by the winning unit was considered. Suitable awards for the individual members of the winning unit were also recommended. This study resulted in an approved council recommendation which allocated the sum of $1,480.00 to the Commandant of The Armored School for the promotion of combat leadership. It was stipulated that there would be no cash awards and directed that awards be made to the outstanding leader in each graduating class within the Armored Officer Candidate, Tank Leadership and Armored Reconnaissance Leadership Courses. The value of these awards was limited to $50.00 for the Officer Candidate Courses and $40.00 for all the others.

During the fiscal year 1954, funds were again made available to the Commandant of The Armored School for individual and team prizes for twenty-four different classes pertaining to Armor Leadership. Also for the first time the fund was utilized to provide one individual and one team prize for the Reserve Officer Training Corps summer training period held at Fort Knox. These leadership awards have been continued at The Armored School with certain minor revisions annually. The revisions are not of a major nature, but depend more on additions or deletions to the curriculums.

In early 1955, General Williston B. Palmer, President of the Armor Association, forwarded to Continental Army Command, with comments, a proposal to reinstitute leadership tests for Armor units on an Army-wide basis. The proposal and General Palmer's comments pertaining thereto were studied and after consideration by the council, a proposed regulation was drafted and forwarded to the Chief of Staff, United States Army, for approval. The council, in drafting the regulation, definitely considered that any tests being administered to Armor units on a world-wide basis would have to be broad enough in scope to allow inclusion of the local mission assigned to the units competing. Based on this factor, the recent Army Regulation 672-73 does not attempt to prescribe a definite method of testing but establishes as the main criterion for competition that participating platoons must have reached the status of training required by Army Training Test 17-1.

Competition for the award is limited to the tank platoons of the competing Armored Division. The parent company will retain possession of the master trophy until the next annual award and in addition to this, will receive a suitable plaque for permanent retention. Individual trophies will be awarded the members of the winning platoon.

As directed by the regulation, the Commanding General, Continental Army Command has designated the 2d Armored Division now stationed in Germany as the organization whose tank platoons will compete for the Armor Leadership Award for this year. The platoons of the 2d Armored Division undoubtedly will have elements of their present mission incorporated in the competition. At present a board appointed by Major General Clark L. Ruffner, the Division Commander, is engaged in formulating the test to be administered.

Provisions also have been made to include the National Guard Armored Divisions within the scope of competition for the Armor Leadership Award and from time to time they will be selected in turn to compete.

The present council administering the expenditures from the trust fund is composed of Major Generals E. W. Ridings, G3, CONARC, L. L. Doan, Chief, Armor Section, CONARC, and C. V. Bromley, Commanding General, The Armored Center, with Captain R. A. Berube, Office of the Comptroller, CONARC, as custodian.

Several proposed designs of the master trophy were submitted by prominent firms and bids for the manufacture have been invited. The trophy will be over fourteen inches in length, ten inches in width and twelve inches in height. It will consist of silver and other appropriate materials mounted on fine wood.

This year, approximately thirty years after the initial donation, platoon leaders and soldiers throughout Armor will compete for an award created by a benefactor who thoroughly believed in the development of the young leaders and the small units of their branch.

NEWS NOTES

New Radio Designed for Airborne Operations

Development of a versatile new long-range radio transmitter-receiver for jeeps, tanks and trucks that goes on the air moments after being parachute-dropped in its vehicle, was announced recently by the Department of the Army.

This technological advance in the family of ground radio communications is the result of joint efforts of the Army Signal Corps Engineering Laboratories of Fort Monmouth, New Jersey, and the Collins Radio Company, Cedar Rapids, Iowa.

Engineered to replace models used during World War II and the Korean fighting and four times more powerful, the set combines advanced design with better parts to pack more power into a smaller space. It covers more distance—in recent tests over 2,000 miles—gives clearer signals and gets through more often.

In forward combat areas extremely wide frequency range of the new set offers a better opportunity for Infantry, Artillery and Armor to talk to each other, knitting these units into a harder-hitting tactical team.

Messages now can be sent over mountains or other barriers without relay radios. An Airborne group parachuting a few hundred miles inside enemy lines can report almost immediately to command headquarters. Friendly troops in separated valleys—with a division often spread 40-50 miles as in Korea—will have instant communications.

Both voice and radio teletype messages can be sent and received at the same time. A few added parts link in the Signal Corps lightweight 100-word-per-minute teletypewriter—an impossibility with earlier sets. Also, if desired, the transmitter can be remotely controlled from up to 75 feet away.

Easy to use and operate, the new radio has seven channels pre-set as in push-button models. The operator merely switches to the one he wants, presses his microphone button, and talks. Releasing his microphone button, the receiver cuts in automatically. For any other channel, he turns a dial to the right number on the set panel.

A total beginner can be taught in ten minutes all he needs to know about using the set, which knobs to turn and when. The radio does the rest by automatically tuning itself and its antenna.

Keeping the radio in good working order in the field is almost as easy. Any defective part is unplugged and another inserted. Replaced parts are repaired later at depots.

Stability has been so greatly improved that crystals are no longer needed to keep the new set tuned on a channel. This does away with substituting crystals whenever new frequencies are wanted. Earlier models depended on these quartz devices to lock in the wanted frequency and prevent drifting off channel.

The new radio is powered by its vehicle's regular battery, plus a special generator, and fits snugly into its reserved space in reconnaissance cars, tanks and jeeps.

It works in temperatures from minus 40 to plus 149 degrees Fahrenheit, in rain, sleet or snow. By reversing a few small ventilating covers it can be sealed for long periods in all kinds of weather.

More Helicopter Units Assigned to European Command

The 587th Cargo Helicopter Company, Fort Sill, Oklahoma, was deployed to Europe in February, the Department of the Army announced recently.

Equipped with 21 Sikorsky H34 light cargo type helicopters, the company is the first of three such organizations scheduled for transfer to Germany before June 1. A helicopter company equipped with light H19 utility type helicopters has been assigned to the European Command since 1953.

The 587th Cargo Helicopter Company includes nine officers, 34 warrant officers and approximately 100 enlisted men who, with their aircraft, were ferried to Germany by a Navy utility type aircraft carrier.

The H34 helicopters, each capable of transporting 14 combat equipped soldiers or approximately one and a half tons of cargo, will provide additional tactical air mobility for the U. S. Seventh Army.

LOGEX 56

More than 5,000 military personnel will participate in LOGEX 56, a logistical exercise involving simulated combat forces, to be held between April 29 and May 5, 1956, at Fort Lee, Virginia, the Department of the Army announced recently.

LOGEX 56, the eighth in a series of annual logistical exercises, will stress the importance of maintaining continuous logistical support under assumed combat conditions with an enemy capable of employing mass destruction weapons. Logistical concepts employed in LOGEX 56 will include and extend the type of logistical operations played in Exercise SAGEBRUSH. The current concept stresses new methods of dispersion, mobility and flexibility to counter the effects of mass destruction weapons which might be experienced in future warfare.

Maneuver Director for the exercise will be Brigadier General Alvin G. Viney, Commanding General of the 1st Logistical Command, Fort Bragg, North Carolina. Participating personnel will include students and faculty representatives from various Army technical and service schools; selected Army Reserve officers; and representatives of the Departments of State, Navy and Air Force. In the play of the exercise, student officers will assume roles of the logistic staff and command positions found in combat and communication zones.

Last National Guard Unit Released from Federal Service

The last National Guard unit remaining on active duty with the Army, one of the 2161 which were called into federal service following the outbreak of fighting in Korea, was returned to State control on February 1. The 115th Engineer Combat Battalion, activated May 1, 1951, at Fort Douglas, Utah, reverted to its former status as part of the Utah National Guard. It had been assigned to Fort Leonard Wood, Missouri.

The transfer involved return to the State of the Battalion's designation, flags and standards. Its original Guard personnel have long since been released from active duty. Replacements making up the battalion at the time of deactivation were transferred to other active Army units.

A total of 165,197 Guardsmen were called to active duty during the Korean emergency. Of that number, 119,603 were in 1,675 units of the Army National Guard, including eight infantry divisions, three regimental combat teams and smaller outfits. A total of 45,594 Air National Guardsmen were called up in 486 units which included 22 wings.

During the Korean War the National Guard turned over to the U. S. Army more than $193,000,000 worth of military vehicles and equipment which had been rehabilitated in its own shops after World War II. More than $500,000,000 worth of equipment and facilities were provided by the Guard to the U. S. Air Force during this period.

World War Tank Corps Association to Hold '56 Meeting at Gettysburg

The World War Tank Corps Association is planning to hold its annual meeting at Gettysburg, Pennsylvania this summer during 13-15 July. Active and former Armored personnel are invited to attend. Various members are being asked to bring food peculiar to their particular communities. Two years ago, when the last reunion was held in Gettysburg, members brought earth from each of the 48 States. For further information or reservations contact: Mr. Tom White, National Adjutant, 708 Wallace Street, Indianapolis, Indiana or Mr. Morion D. De-Tar, Reunion Chairman, Aero Oil Co., New Oxford, Pennsylvania.

Enlisted Appointments to West Point

The Army will use a new means of selecting Army and Air Force Regulars, Reservists and National Guardsmen for appointment to the United States Military Academy this year. They will employ the Interview Board instead of the former method of taking Civil Service Examinations.

Applications will be accepted through the 31st of May of this year, under regulations due to be released in mid-March. Those applicants who rank highest in each component will be appointed about 1 August and the qualified Regulars will be sent to the Army Preparatory School at Stewart Air Force Base, New York, in anticipation of the March 1957 West Point entrance examinations.

The new selection system is designed to select academic ability, leadership potential, motivation for a military career and character traits.

Infantry RCT to Become BCT

The 351st Infantry Regimental Combat Team at Fort Rucker, will be reorganized as a battalion combat team early in April the Department of the Army announced recently.

The reorganization will assist in activation of the 101st Airborne Division scheduled for August or September, 1956, at Fort Campbell. The newly formed battalion combat team will provide training support for the Army Aviation School at Fort Rucker. Remaining personnel spaces from the 351st Regiment will be allotted to the 101st Airborne Division.

The experimental 101st Airborne Division will be completely air transportable, whereas the present airborne divisions are equipped for both sustained ground combat and airborne operations. The new division will possess great strategic and tactical mobility and incorporate the most advanced concepts of organization of forces in the atomic era. It will be equipped with the most modern lightweight weapons and equipment available.

IN MEMORIAM

LIEUTENANT GENERAL DANIEL VAN VOORHIS, United States Army, Retired, died at Walter Reed Army Hospital, Washington, D. C. on 9 January 1956 at the age of 77. He is buried at Newark, Ohio. Born in Zanesville, Ohio, in 1878, he was mustered into the Federal Service in 1898 as a Corporal in the 10th Pennsylvania Volunteer Infantry. He was appointed Captain the same year and ordered to the Philippines participating in the Insurrection. He was appointed 2d Lieutenant of Cavalry in the Regular Army in February 1900. His early service included three more tours in the Philippines as well as the Infantry-Cavalry School and the Mounted Service School. For a time he was Aide to General Bell and while serving at Fort Myer, was Aide for President Taft. During World War I he was the first Chief of Staff of the Port of Embarkation at Newport News, then Assistant Chief for Personnel at the Base Section, Brest, France. During the twenties he served a tour of duty in the Office of the Chief of Cavalry and graduated from the Army War College in 1929. Then a Colonel, he was given command of the 12th Cavalry from which he was selected by the Chief of Staff, General Summerall, to command the Mechanized Force, an experimental unit of all arms, organized at Fort Eustis in 1930. Here began the modern concept of mobile warfare in which the horse was to be replaced by the machine. The Mechanized Force was disbanded after one year and the problems of mechanization returned to the respective arms. Colonel Van Voorhis led the Cavalry and some supporting elements of the Force to Camp (now Fort) Knox, as the "Detachment for Mechanized Cavalry Regiment" which, in 1933, grew into the 1st Cavalry, Mechanized, and in 1936, into the 7th Cavalry Brigade, Mechanized. Colonel Van Voorhis left Knox in 1934 to become Chief of Staff of the Hawaiian Department, returning as a Brigadier General in 1937 to command the 7th Cavalry Brigade, Mechanized, and develop the doctrines which guided the initial efforts of the Armored Force when it was organized in 1940. Meanwhile General Van Voorhis advanced to the grade of Major General in 1938 and was given command of the V Corps Area. In December 1939 he was transferred to Panama in command of the Caribbean Defense Command with the rank of Lieutenant General. In September 1941 he returned to the V Corps Area where he retired the following year. His was the guiding spirit that accomplished the successful transition from horse Cavalry to mechanized Cavalry, the first and crucial step in the development of Armor. Armor is deeply indebted to the vision and judgment of this far-sighted cavalryman.

news from THE ARMORED SCHOOL

The Armored School Field Manual Program

The Command and Staff Department of The Armored School is responsible for the development of doctrine and the preparation of Armor training literature relative to the tactical employment of Armor units. This responsibility includes the preparation of recommended changes to current field manuals, revision of existing field manuals and the writing of new field manuals.

A review of our current field manuals indicates that the majority of our tactical field manuals require major revision. This is due to new developments in the doctrinal, organizational and equipment fields and by the requirement to suspend changes and revision of field manuals until a final decision has been reached on the ATFA program.

The revision of all existing tactical field manuals will be a major task. To accomplish this mission, a provisional Training Literature Section has been organized under the supervision of the Monitoring and Doctrine Office of the Command and Staff Department. This section has been charged with the responsibility of preparing all training literature for the Department.

The following is a list of field manuals that have been assigned to the Command and Staff Department for revision or writing:

FM 17-10 Armored Infantry Rifle Platoon and Company.

FM 17-20 Armored Infantry Battalion.

FM 17-22 Reconnaissance Platoon and Company.

FM 17-32 Medium Tank Platoon and Company.

FM 17-33 Medium Tank Battalion.

FM 17-735 Reconnaissance Battalion.

FM 17-50 Logistics, Armored Division.

FM 17-95 Armored Cavalry Regiment.

The best critics of our field manuals are personnel required to employ and use Armor doctrine, tactics and techniques each day. It is to these people we turn for assistance in writing our field manuals. Therefore, The Armored School solicits recommendations and comments from commanders in the field, Armor instructors at other service schools and Armor Advisors of National Guard and Reserve units.

Provisional Reconnaissance Troop (SKYCAV)

One of the most enthusiastically received and widely publicized features of the recently completed Exercise SAGEBRUSH was the test of an organizational and operational concept for a Provisional Reconnaissance Troop called SKYCAV. Under the direction and guidance of the Department of the Army and Continental Army Command, The Armored School undertook the project aimed at developing a combination ground and air reconnaissance element for use primarily at division level.

Equipped with both ground reconnaissance vehicles and army aircraft, as well as with organic photographic equipment and electronic surveillance devices, the SKYCAV test was a project which generated intense interest among combat arms and technical service observers alike. Its performance in the Louisiana maneuver indicated that this concept is a substantial step in the direction of expanding the division's information-gathering capability.

The high degree of mobility inherent in the SKYCAV concept, coupled with its flexible and extensive communications capability, enables this unit to cover much greater areas under nearly all conditions of visibility. At the same time, through use of its photographic and electronic equipment, the information gathered by the troop can be placed in the proper hands with a speed heretofore unknown in reconnaissance operations.

In March of last year CONARC directed The Armored School to initiate the SKYCAV project, including development of an organization, training text and test plan. Following approval of the School's detailed plan of test, training of the troop was undertaken at Fort Bragg, North Carolina, under the supervision of the 82d Airborne Division. This training was monitored throughout by Combat Developments Group representatives from The Armored School. During the actual maneuver, SKYCAV was employed as part of the Aggressor Forces.

The provisional troop itself was commanded by a field grade officer. Its operational sub-units consisted of a ground reconnaissance element, made up of specially trained reconnaissance personnel mounted in both armored and unarmored vehicles; an aerial reconnaissance element equipped with both fixed wing and rotary wing aircraft; and a surveillance element consisting largely of specialist personnel trained in the operation of such "modern weapons" as intrusion detection devices, radar, and infra-red equipment. Administrative and maintenance support for the unit was furnished by a troop headquarters equipped to care for all aircraft and vehicles as well as the organic electronic and communications equipment. In addition to the still cameras normally found in reconnaissance planes, SKYCAV featured the employment of aircraft-mounted television cameras.

In the view of most observers, SKYCAV represented one of the most encouraging aspects of the SAGEBRUSH operation. The experimental troop proved one of the most flexible organizations yet to appear on the reconnaissance scene. It pointed up the feasibility as well as the desirability of having organic to the division a reconnaissance element which may be employed, according to the demands of each separate situation, either as a whole or in any number of combinations of its elements.

Armor Extension Course Honor Roll

One extension course student was placed on the honor roll during January 1956. This outstanding student is First Lieutenant Thomas J. LeVasseur, Jr., Headquarters CCB, 5th Armored Division, Camp Chaffee, Arkansas.

Key Personnel Changes

Colonel Melvin A. Goers has been named Executive Officer of The Armored School and will assume his new duties on or about 23 February 1956.

Lieutenant Colonel Marshall B. Allen has been designated Chief, Planning Division, Combat Developments Group.

Major R. E. David is now Executive Officer of the Automotive Department.

THE ARMORED SCHOOL HONOR GRADUATES

The following students received the top scholastic honors of their class:

Advanced Noncommissioned Officers Number 2

Master Sergeant John K. Phillip, Company C, 33d Tank Battalion, 3d Armored Division, Fort Knox, Kentucky.

Armor Track Vehicle Maintenance Number 8

Master Sergeant Gordon L. Monneyham, Company B, 30th Armored Ordnance Battalion, 30th Armored Division, Tennessee National Guard, Nashville, Tennessee.

Armor Track Vehicle Maintenance Course Number 9

Private First Class Frank A. Mueck, Headquarters and Service Company, 4th Armored Division, Fort Hood, Texas.

Armor Turret Maintenance Course Number 4

Private First Class Richard D. McConnell, Headquarters and Service Company, 1st Tank Battalion, 1st Armored Division, Fort Polk, Louisiana.

ARMOR LEADERSHIP AWARD

The Field Proficiency-Armored Leadership Award was established for the purpose of promoting and developing combat leadership on a competitive basis and to test the selected outstanding leaders of the Tank Leader and Reconnaissance Leader course. Top honor was taken by the following team:

Team Leader

Master Sergeant Edmond H. Krysinski, Headquarters and Service Company, 7th Tank Battalion, 3d Armored Division, Fort Knox, Kentucky.

Team Members

Sergeant First Class James Coles, Tank Company, 511th Airborne Infantry Regiment, 11th Airborne Division, Fort Campbell, Kentucky.

Sergeant Nelson G. Hurd, Company C, 29th Airborne Infantry Battalion, 3d Armored Division, Fort Knox, Kentucky.

Corporal Wilbert M. Allen, Company B, 1st Battalion, 112th Armored Cavalry Regiment, Texas National Guard, Harlington, Texas.

Corporal George M. Day, Company B, 1st Battalion, 112th Armored Cavalry Regiment, Texas National Guard, Harlington, Texas.

Corporal Robert Callsen, 46th Reconnaissance Company, Michigan National Guard, Detroit, Michigan.

Recently, while doing some research in back copies of our journal, I found myself spending too much time reading and not completing my task at hand—the research problem. I made one promise—to go back and peruse at my leisure these early journals.

With publication of this issue—the March-April 1956 issue—a review of Volume 1, Number 1, published in March 1888, seems in order. The contents prove most interesting. The lead article is entitled "Some German Ideas on Cavalry" by 2d Lieutenant F. S. Foltz. It is actually a review of a book written by Prince Kraft De Hohenlohe. The second article, "Remounts" by Captain Moses Harris of the 1st Cavalry, is an oft discussed subject in all our early journals. The next article is on "The New Field Artillery Gun and Carriage" by C. W. Whipple, an Army Ordnance Captain. In the lead paragraph the author states in view of the fact that all our field batteries would be issued these new steel guns and carriages by next Spring it was thought the Association might be interested in a brief description of them. The next three articles deal with a subject whose pros and cons must have been thrashed out in every meeting where there were two or more Cavalrymen be it a formal meeting place, the Officers' Club or elsewhere. The titles and authors are: "The Use of Arms, Mounted" by Captain W. P. Hall, First Cavalry; "Sabers or Revolvers" by Lieutenant Eben Swift; and "Devices by Means of which Effective Mounted Firing with the Pistol and Carbine can be obtained by the Cavalry in Attack" by Colonel J. C. Kelton, Assistant Adjutant General of the Army. "Marching Cavalry" by Brigadier General Wesley Merritt, our first Association President, is next, followed by another treatise on the values of replacing the saber with the carbine, entitled "Mounted Fire Action of Cavalry" by Major G. B. Sanford of the 1st Cavalry. Captain J. B. Babcock discusses the merits of "Dismounted Service of Cavalry," and the organization, tactics and drill of "The French Cavalry" by Lieutenant O. L. Hein concludes the articles published in the initial issue of the forerunner to our now well-known ARMOR. The Constitution and By-Laws of the Association are printed in this 1888 issue and are worth some time and discussion. Also there appear a list of members and a book section listing important books for use by the military.

The Constitution established Headquarters for the Association at Fort Leavenworth, Kansas. Branches were authorized anywhere there were eight regular members stationed. Initially branches were established at West Point, New York and Fort Reno, Indian Territory. Proceedings and papers read at branch meetings were forwarded to headquarters at Leavenworth. From these papers selection was made for publication in the magazine by a special committee appointed by the president. Names of the committee were not announced.

At that time only Regular and former Cavalry Officers of honorable record could be active voting members. From the first list of members, published 68 years ago, we see many officers of other branches and members of various State Militia units as Associate members. (This constitution was not amended until the Annual Meeting held at Fort Leavenworth in January 1911. At that time members of State Militia were admitted as active members.) Today National Guardsmen from the various Armored units around the country make up a large percentage of our active, voting membership.

Much water has gone under the bridge since that initial issue of the *Journal of The United States Cavalry Association.* We have turned in the saddle soap for a grease gun, the oats bag for an oil can and the saddle bag for a bedding roll. But our aims and purposes remain the same. In our first constitution our aims were stated as "The design of the Association is professional unity and improvement and the advancement of the cavalry service generally." Our aims since have not changed materially. In the contents of the first journal we see articles on tactics, military history, other branches of the service and our own mobile arm. Turn to page one of this issue of ARMOR and notice the contents. Articles suggesting our future methods of warfare, which should serve to stir the imagination of any person interested in the future of our Army; articles by participants, both instructors and trainees, on Reserve Forces Training, a current problem in the service; an article on lighter weight vehicles; and a book review of an outstanding military historical book; these articles are intended to assist our military professional in the better performance of his duties. To obtain this material we have called on some of the contributors. But for the most part it was submitted by individuals who sincerely believe that they are assisting in the education of members who will take the time to study the contents.

How good is the material? That depends on the contributors who submit it—not for pay but gratuitously in the hope that it will benefit their brother members. We need more material to give us a wider selection. How widely and well is it received? That depends on the number of members. Our circulation is about even with last year but the rate of renewals could be higher. We are most pleased to have renewals because in this way we feel that we are doing our job in holding our current membership by giving them what they need, what they want and what will help them in the furtherance of their profession. Are we doing what we set out to do? Only you can tell us the answer. We feel that we have been a great help to the newly converted National Guard units, judging by the comments we have received. In checking our renewal rates we find that we lose more unit subscriptions than individual members. This we cannot explain because we have felt for some time that each and every Armored Company, regardless of the branch—Artillery, Infantry, Engineer, or what have you, can benefit by placing the journals in the dayrooms for use by the enlisted personnel. We recently had a letter from a Corporal in a Tank Company who said that he desired to continue receiving ARMOR. Although he could not afford it he needed it in his work. His unit had received a copy but their subscription had run out; therefore he had to buy it personally in order to better do his job.

What is the status of your unit's subscription? Come to think of it—With the Annual Meeting staring us in the face—What is the status of your membership? Have you received your membership card? You'd better check—if you have not you'd better renew right now so we can see you at Fort Knox, come the 26th of April.

The Editor

Civilian Schooling for Army Officers

An article on this pertinent subject appeared in the July-August 1954 issue of ARMOR. However, due to many changes, CMD personnel feel it worthwhile to bring you up to date.

SINCE 1946 approximately one out of every ten Regular Army officers has earned a master's degree or equivalent under the Army Civil Schooling Program. The objective of this program is to provide adequate training in appropriate fields of study in order to produce officers capable of coping with the political, economic, scientific and social problems related to the military duties they perform. Officers are not sent to school to raise their level of education, but rather to receive training not provided by the service schools.

Over five hundred Army officers in grades from Lieutenant to Colonel are currently engaged in full time graduate work in almost 50 colleges and universities throughout the country. The bulk of these officers are training at the master's degree level with an occasional officer working toward a Ph.D. degree.

AR 350-200 published recently authorizes, for the first time since 1948, Reserve officers who meet certain prerequisites to apply for this training. These regulations cover in considerable detail most aspects of the program including eligibility criteria for both Regular and Reserve officers.

Of interest to many officers is how to apply for this training and what factors are considered in selection. For Combat Arms officers, application procedure as well as the list of study fields is outlined in SR 350-230-52. Officers of other branches may secure information on application procedure by writing directly to their career management branch.

An application once made is retained on file and the applicant is considered competitively each year. His application will remain active until he is selected or is no longer eligible because he has passed the age limit, or until he requests that his application be withdrawn.

In selecting officers for participation in this program, both the military record and the academic background of each applicant are considered. The officer's military record plays a vital part in selection. To be selected an officer normally must have a balanced career pattern for his branch. In addition his overall manner of performance with respect to his contemporaries is evaluated as part of this competitive selection.

To be selected for civil schooling an officer should have an above-average undergraduate record. Applicants for engineering and physical science courses must have an excellent undergraduate record in mathematics, including calculus.

After completing civil schooling, an officer is assigned to serve a three-year utilization tour in a position which requires special knowledge in the field of his graduate training. He then reverts to the normal career pattern of his branch. While he may not be required to serve another utilization tour, he remains available to fill positions requiring his special training. The utilization tour can be interrupted to permit an officer to attend a service school or for other career-broadening assignments.

Final Semester Plan

The preceding discussion has dealt with training of officers who already possess a bachelor's degree. The Army also offers considerable assistance to officers who pursue undergraduate courses on their off-duty time. This program comes under the supervision of the Chief of Information and Education.

Of particular interest to officers in this category is the "Final Semester Plan" which is outlined in Change 1 to AR 355-50. The purpose of this program is to enable qualified officers to satisfy traditional residence requirements for a baccalaureate degree.

Each semester one hundred Army officers may be given a six months' leave to complete requirements for the bachelor's degree. Selections will be on a competitive basis from among those officers who apply to their branch of Career Management, as outlined in the regulations referred to in the preceding paragraph.

Among other prerequisities applicants must be able to satisfy the residence requirements for a degree within a six months' period.

Both Regular and Reserve officers are eligible for this program. Officers receive their pay and allowances only. All other expenses including travel, tuition, etc., must be borne by the individual officer.

Advanced Management Training

Unique among Army civil schooling opportunities is the Advanced Management Program conducted at Harvard and Pittsburgh Universities. A maximum of five senior Army officers attend each of these Universities twice yearly.

Both Colonels and Brigadier Generals are eligible for the thirteen-week Harvard course. The nine-week Pittsburgh course is open to Lieutenant Colonels and Colonels.

The majority of the students in these courses are mature, experienced executives from business and industry selected for this instruction because of their great potential with their organizations. Subject matter in the courses includes business policy, administrative practices, industrial relations, business and the American society and related fields. It is evident that this training, and the association with civilian executives, is most valuable in preparing Army officers of all branches of service to assume responsible management positions within the Army establishment. Selections are limited to those applicants who have demonstrated potential for continuing advancement within the Army.

Prerequisites for attendance at these courses, as well as application procedure, are outlined in SR 350-230-51.

"How would you do it?"

SITUATION

21st Tank Battalion, part of CCB, 301st Armored Division, was engaged in some of the fighting along the division front on 23 August. The battalion was directed to move during the night into an assembly area, preparatory to continuing the attack. It is now located in the assembly area in BLACK FOREST. At 240800 August, the battalion commander gives his staff the following information:

1. CCB attacks 250600 across DEEP RIVER to seize the important communications center of SMUTVILLE.

2. This battalion will lead the attack along the axis SMOKEVILLE, HOUSEBURG, SMUTVILLE.

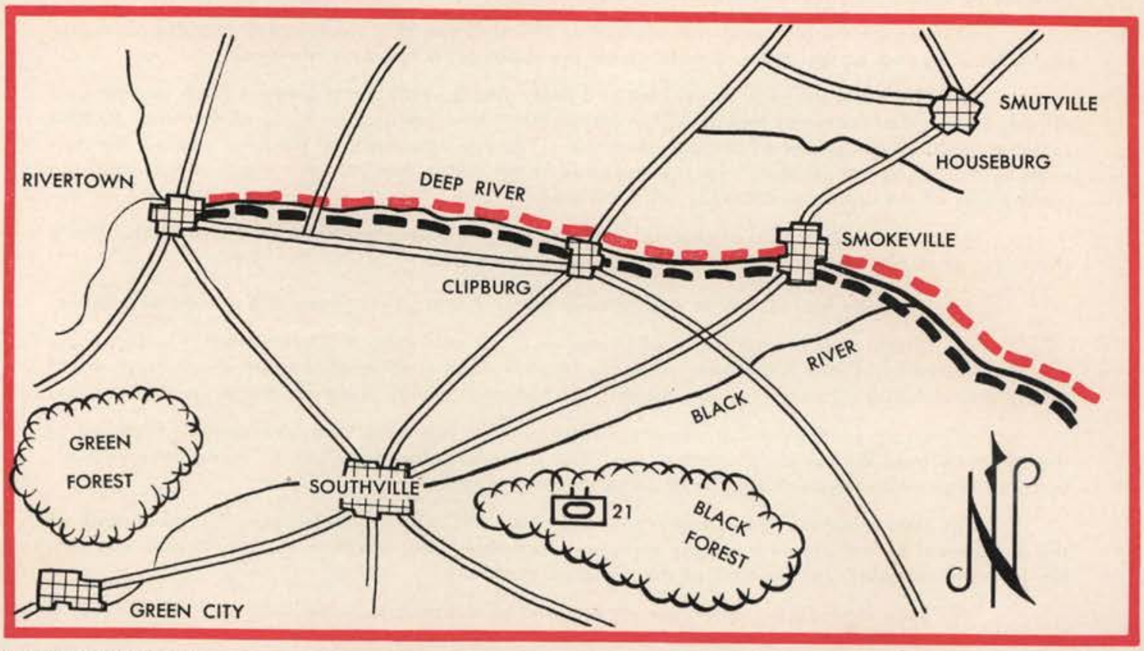
3. Company C, 121st Armored Infantry Battalion, will be attached to us for this operation.

PROBLEM

You are the battalion S4. Upon your return to the battalion trains area, you find that Company C, 121st Armored Infantry Battalion, has just closed into the assembly area. What would be your actions with reference to logistical matters pertaining to the following?

① Company C, 121st Armored Infantry Battalion.

② Your Battalion.


SMUTVILLE
HOUSEBURG
RIVERTOWN
DEEP RIVER
SMOKEVILLE
CLIPBURG
RIVER
BLACK
GREEN
FOREST
SOUTHVILLE
21
BLACK
FOREST
GREEN CITY
N

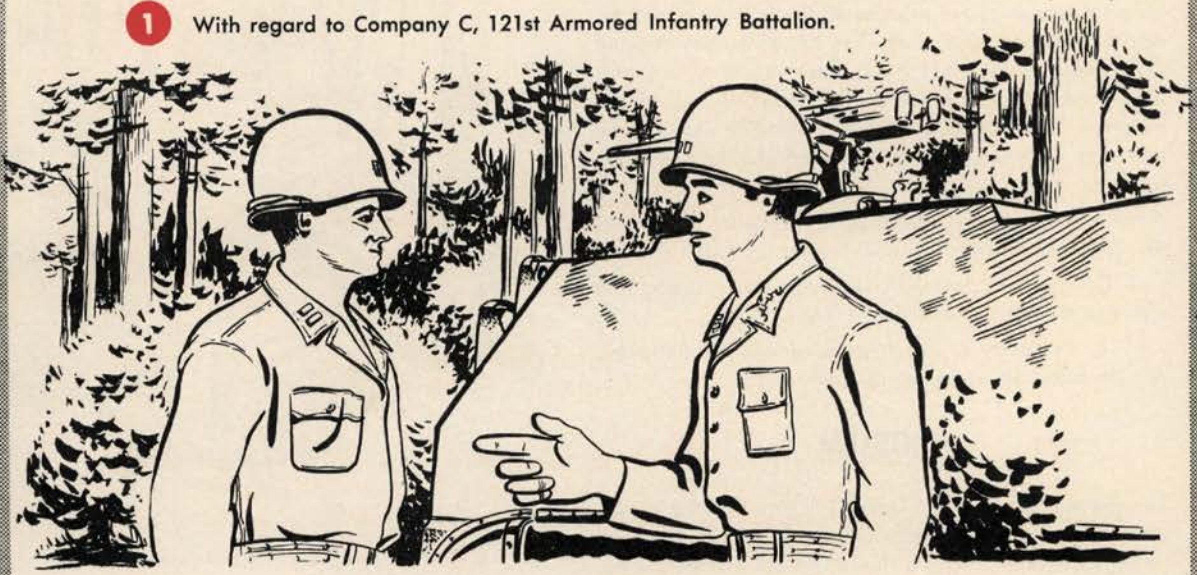
AN ARMORED SCHOOL PRESENTATION

ILLUSTRATED BY MR. J. H. BAIN

Solutions - - -

To ensure complete coordination of logistical support activities between the organic and attached elements of the tank battalion, it is necessary to determine the status of supply, mess, equipment, medical attachments, and maintenance of the unit attached. Therefore, your actions would be:

① With regard to Company C, 121st Armored Infantry Battalion.



(1) Acquaint the armored infantry company commander with the battalion SOP, as it pertains to supply, maintenance, vehicular evacuation, and medical support.

(2) Instruct the battalion communication officer to see that Company C has the necessary signal supplies and equipment and to check on the status of its radio maintenance.

(3) Check the status of its vehicles and determine the number of vehicles (both combat and administrative) that are ready for immediate employment, and make an estimate of the time required to place inoperative vehicles in combat readiness. (You can obtain information for making this estimate by discussing the problem with the company motor officer, the battalion motor officer, and the commander of the ordnance company supporting CCB.)

(4) Have the ammunition checked to ensure that the prescribed basic load is present. Where shortages exist, take action to have the basic load replenished.

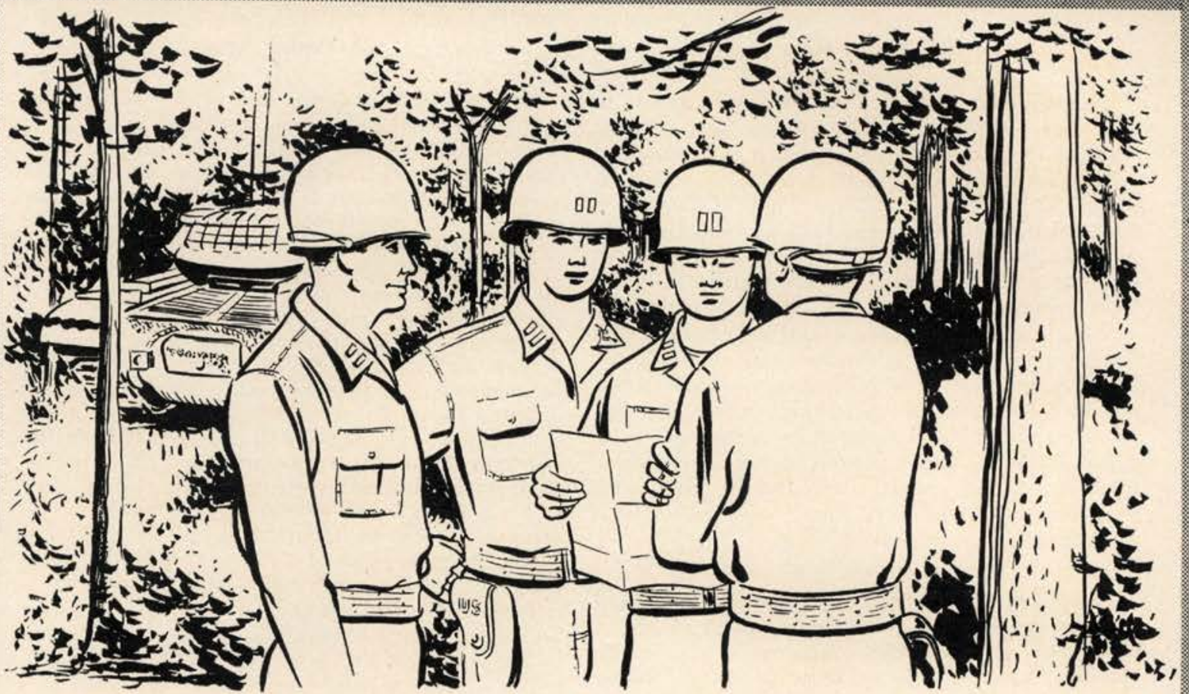
(5) Have the fuel supply in each vehicle checked, and refuel all vehicles as soon as possible.

(6) Check on the condition of all weapons in the company; if you feel that it is necessary, you may recommend that a complete weapons inspection be conducted. In any event, you would satisfy yourself that all personnel are properly armed and that all weapons are in good condition.

(7) Check on the number of supply vehicles (fuel, lubricant, and ammunition) attached to the company from the supply platoon of the 121st Armored Infantry Battalion. Familiarize yourself with the amount and type of supplies loaded on these trucks.

(8) Determine the additional amount of class I, III, and V supplies required as a result of the attachment of the armored infantry company. In making your estimate, you would probably confer with the company commander of the attached company.

(9) Take immediate steps to correct any and all deficiencies noted.



② With regard to your battalion. In addition to the above actions with reference to Company C, 121st Armored Infantry Battalion, you would accomplish the following in the assembly area, prior to the attack:

(1) Coordinate with the battalion surgeon, motor officer, and communication officer on the procurement of their supplies. (Medical, ordnance, and signal items of supply are usually procured by the battalion surgeon, motor officer, and communication officer, respectively, but the S4 supervises and ensures the procurement of these items.)

(2) Effect complete resupply of gasoline, oil, ammunition, rations, and water for all vehicles, if required. (A reserve of combat type rations is carried on each vehicle in accordance with unit SOP.)

(3) Since some trucks will have only a partial load after the battalion is resupplied, ensure that the partial loads are consolidated and empty trucks sent back to division for refill.

(4) Form your battalion combat trains, tailored to accomplish the mission required. (Battalion combat trains are those logistical elements and vehicles needed for the **immediate** support of the operation.)

(5) Check with the battalion motor officer to make certain that the necessary maintenance has been performed on all vehicles and that adequate parts are on hand.

(6) Prepare your plans for resupply, vehicle recovery and evacuation, and personnel evacuation. (Vehicle evacuation and personnel evacuation plans will be made by the battalion motor officer and surgeon, respectively; however, the battalion S4 is responsible for the coordination of these plans and must fit them into the over-all logistical support plan for the battalion.)

(7) Make a map reconnaissance of the future locations to be occupied by your battalion combat trains. Before actually moving the trains, however, you will make a personal reconnaissance, if possible, of the proposed location.

(8) Make a final check on the location of the various division supply agencies upon which you depend for support.

(9) Present your logistical plan to the battalion commander and point out existing problems or deficiencies.

FROM THESE PAGES

65 Years Ago

The military lessons of our civil war appear to have had but slight significance for other nations. Some of the conditions under which the operations of our armies were conducted being dissimilar to those which prevail on the continent of Europe, it was, apparently, concluded that no useful lessons could be learned, and our four years' struggle was regarded with little more interest than might have been bestowed upon a war between savage tribes. The increased independence and efficiency of the cavalry arm, due to the improvement in fire-weapons, was displayed as an object lesson which should not have been difficult of comprehension; and yet, because the methods employed by our cavalry were opposed to old world traditions, it has been stigmatized as mounted infantry, and the fact that it repeatedly charged infantry lines, successfully, with the saber, studiously ignored.

* * *

Nevertheless, if it may with justice be claimed that the grand result of these operations could not have been achieved without the cavalry and its impetuous leader, so it should be acknowledged that it was made possible only by the splendid fighting and marching qualities of our infantry and artillery, directed by the wisdom and intelligence of the great General-in-Chief.

Captain Moses Harris

With the Reserve Brigade

50 Years Ago

It would certainly seem to an impartial observer that there could be no growls about improvement by study. We recall the top line in our old copy book—Knowledge is Power—with capital K and P, but nevertheless we do hear the remarks, old as time, about the new fad and how long it will last, etc. It has been our observation that much of the knocking of the present school system comes from officers that stand most in need of the system for themselves. But our innate desire not to wound feelings prevents our making this remark to them personally. Such, however, has been our observation, fairly keen, as we have taken great interest in the matter, and we are satisfied that such has been the observation of the majority. Of course there are many officers that can point out defects and suggest remedies, but they are not as numerous as the plain complainers who have no remedies to suggest.

Nothing can stop the tread of progress, and certainly the school fad makes as much, probably more, for advancement than any of the previous fads. We can inform the young men of the service that it will be much better for them to get on the band wagon than to stand on the ground listening to the carpings of some disgruntled officer while the wagon rolls by. Our advice to the younger officers is to get busy in their post schools, and get to the service schools if they can.

Editor's Table

Fads

25 Years Ago

The World War tank was a vehicle of such low speed that it could only be employed as an immediate auxiliary to the infantry. The success which was attained with this weapon in its primitive stage of development has led to the expectation that with the improvements certain to take place as the result of more deliberate design and automotive progress, the tank can be made an instrument of sufficient power to break up a stabilized situation, restore mobility to the battlefield, and return to the offensive its superiority over the defense as a mode of combat action. Tanks with a cross-country speed of from 20 to 30 miles are now foreseen and will undoubtedly be developed in the near future. This increase of speed will have two important results—it will endow the tank with comparative invulnerability to direct hits by artillery; and it will require its separation in part from immediate attachment to infantry units in order that advantage may be taken of its superior mobility. From the latter action, it will follow that from being an immediate auxiliary of the infantry, the tank will become a weapon exercising offensive power in its own right.

All of the foregoing leads to the conception of a mechanized force of which tanks form the backbone. Since tanks have little holding power, such a force must include a highly mobile infantry to hold the ground gained by the tanks.

General C. P. Summerall

New Developments in Warfare

10 Years Ago

The combat command was the brain child of that Grand Old Man of the Armored Forces, General Adna Chaffee, who, sagaciously counselled by his staff of now famed leaders of our armored divisions, fostered the original idea and fondly watched its growth during his last years.

He visualized that the combat command would be a headquarters of a tactical nature to which could be attached any number of battalions or other units that might be required for a particular task. It is believed by older members of the Armored Forces that General Chaffee never intended that any set composition be made for any combat command, that it should be flexible and not permanent nor even semi-permanent. Its characteristic of being purely tactical in organization would have normally prohibited its retaining any degree of permanency.

However, during the past campaigns in Europe, many armored division commanders chose to create combat commands of fixed composition.

* * *

This method of using the same combination is inclined to build up "the responsibility feeling" for the attached unit over and above that normally intended. It is inclined to take some of the division headquarters' duties and pass them on to the combat command headquarters which, normally, is not staffed to handle such extra problems.

Lt. Colonel Wayne D. Smart

Armored Divisions' Combat Commands

Next to acquiring good friends, the best acquisition is that of good books.

THE BOOK SECTION

10% discount on orders over $5.00. Remit with order and we pay postage.

Prices subject to change without notice. Be sure to send a complete address.

Destruction and Reconstruction

DESTRUCTION AND RECONSTRUCTION. By Richard Taylor, Lieutenant General CSA. Edited by Richard B. Harwell. 380 pp. Longmans, Green and Co., New York. $7.50

Reviewed by
MAJ. GEN. U. S. GRANT III, Ret.

AN interesting and readable book, and a useful contribution to the history of the Civil War, the publishers merit the thanks of the many amateurs of the story of that conflict for republishing it. Originally published in 1879, it had become scarce, and hardly obtainable. The lack of any maps, on which the reader can follow the author's descriptions of military operations, detracts from its interest and usefulness, for any one not already so provided or entirely familiar with the geography of the southeastern quarter of our country.

The son of General and President Zachary Taylor, it is natural that

THE EDITOR

Reeves Studio

Richard Barksdale Harwell served with the Navy in the Pacific Theater during World War II. He ended the war as a Lieutenant, commanding a minesweeper. Returning to civilian life in 1946 he became Assistant Librarian and History Lecturer at Emory University. In 1954 he transferred to Southern Regional Education Board, Atlanta where he was Executive Secretary, Planning Research Library Cooperation. Since this past February he has been the head of Publications Division of the Virginia State Library, Richmond, Virginia.

THE AUTHOR

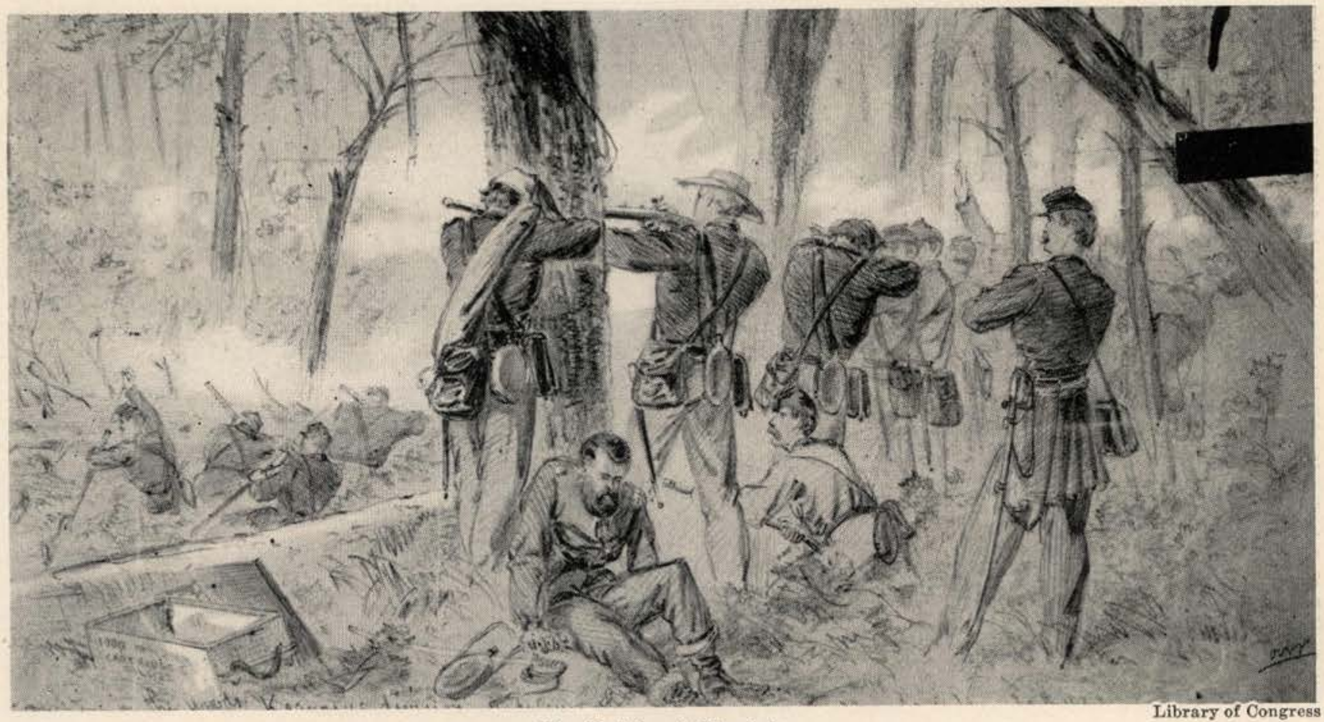
Virginia State Library

Lieutenant General Richard Taylor, CSA, son of President Zachary Taylor, was born in 1826. He graduated from Yale University in 1845. He voted for secession at Charleston in 1861 and was appointed Colonel of the 9th Louisiana Infantry Regiment. He rose to the rank of Lieutenant General and surrendered the last Confederate Army, East of the Mississippi in May 1865 to General Canby. After the War he served as Trustee for the Peabody Educational Fund for promotion of education through the South. He died in 1879.

THE REVIEWER

Brown-Suarez

Major General Ulysses S. Grant III, Retired, grandson of President U. S. Grant, graduated from the United States Military Academy in 1903 and was commissioned in the Corps of Engineers. He served in the Philippines and on the Mexican Border. He commanded the Engineer Replacement Training Center, Fort Leonard Wood, Mo., in 1941. He next was assigned as Chief, Protection Branch, Office of Civilian Defense. Since retirement in 1944, he has been interested in national defense, regional planning and Civil War history.



Library of Congress

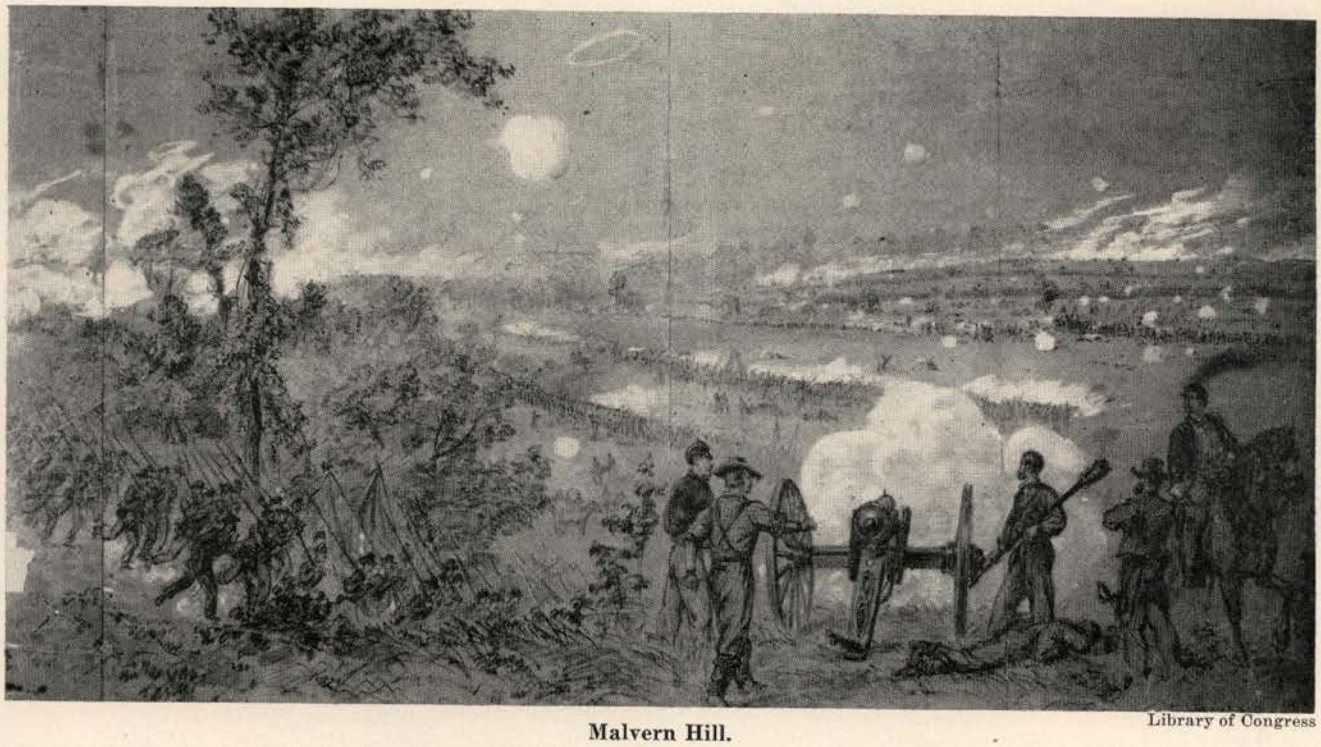
The Battle of Glendale.

General Richard Taylor should have inherited some of his father's military talents and instincts of leadership, although he does not seem to have resembled his father physically. The following description of him is quoted from the *New York Times'* obituary: "Personally General Taylor had none of the roughness of his sire. He was of winning address, rather slight in figure, of courteous bearing and a brilliant talker and writer. A slight dash of cynicism tempered his conversation." His reminiscences show him to have been impulsive and with strong likes and dislikes. Indeed, much of the interest and fascination comes from his vivid descriptions, with their very bright highlights and very black shadows, of the persons with whom he dealt. Generals Albert Sidney Johnston, Jackson and Joseph E. Johnston were his special heroes, while he puts Generals Kirby Smith and Banks clearly at the foot of the ladder; but it is also clear that he had a very high opinion of General Richard Taylor, who apparently made no mistakes.

On the other hand, it is a pleasant change to find an author who does not *pretend to be impartial,* who finds good reasons and justification for Jefferson Davis' actions, so far as they enter into his story, and who at times concedes some ability and good qualities to his opponents. Perhaps it was this keen appreciation of personalities and his innate sense of the military situation, together with the clarity of his prose, that justified the late Dr. Douglas Southall Freeman's reference to his book "as a 'delightful narrative' and 'among the most fascinating of military memoirs' by 'the one Confederate general who possessed literary art that approached first rank'."

Educated in frontier schools and then under James Gordon Carter and William H. Brooks at Lancaster, Massachusetts, and finally at Yale College, from which he graduated in 1845, his military education was limited to what he picked up from his father and others at the military posts at which his father served and while a visitor in the camp at Matamoros in 1846 and from his wide reading. It is therefore somewhat remarkable that from the very start, as colonel of the 9th Louisiana Regiment, he should have shown such a strong sense of the requirements of good military leadership and command: Ingenuity in equipping and feeding his men, good discipline, loyalty to his subordinates as well as to his superiors, and especially an appreciation the importance of the topography and of the position of the enemy. He almost always reports having made a personal reconnaissance of the ground over which his troops were to operate, a precaution too often neglected by other commanders on both sides. Moreover, his estimates of tactical and strategic situations seem to have been generally surprisingly sound.

His reminiscences begin with the claim that the seeds of secession were already planted in the colonial era, and that slavery was not the true issue, followed by a brief of the principal events preceding the 1860 National Democratic Convention in Charleston, South Carolina, which he attended as a delegate from Louisiana. With the withdrawal of the Alabama delegation, the party divided and secession was left to the states to decide each for itself. He attended the meeting of the General Assembly of Louisiana in January 1861, and as a member of the upper house and chairman of the Committee on Federal Relations he proposed a bill to call a Convention of the People of the State, "to consider matters beyond the competency of the Assembly." This convention passed the Ordinance of Secession. It is to his credit that, as he says, "at the time and since, I marveled at the joyous and careless temper in which men, much my superiors in sagacity and experience,



Malvern Hill. Library of Congress

consummated these acts. There appeared the same general *gaite de coeur* that Mr. Ollivier claimed for the Imperial (French) Ministry when war was declared against Prussia. The attachment of northern and western people to the Union; their superiority in numbers, in wealth and especially in mechanical resources; the command of the sea; the lust of rule and territory always felt by democracies and nowhere to a greater degree than in the South—all these facts were laughed to scorn, or their mention was ascribed to timidity and treachery." Out of sympathy with the action taken, he retired to his plantation in Louisiana "determined to accept such responsibility only as came to me unsought."

Events leading to war followed rapidly enough, and by invitation he visited General Bragg, "a particular friend," who was in command at Pensacola of the troops gathering from adjacent states, until recalled to New Orleans to take command of the 9th Louisiana Infantry. "Full of enthusiasm for their cause, and of the best material, officers and men were, with few exceptions, without instruction, and the number of educated officers was, as in all the southern armies, too limited to supply the imperious demands of the staff, much less those of the drill-master. Besides, the vicious system of election of officers struck at the very root of that stern discipline without which raw men cannot be converted into soldiers." It must be remembered that these were shortcomings, as was also the inevitable delay in obtaining equipment, which the Union armies also had to overcome.

Admitting the proven evils of the election of officers, one cannot but ask how else could they have been better selected in the emergency? On neither side had anyone any knowledge of the qualifications for military leadership of possible candidates for commissions. Selection by the political authorities often proved worse, and election of officers by their men at least indicated that those who for the moment had personal contact with them and knew them best, recognized in those elected some promise of such leadership and would submit to their control. To prevent having to have recourse to this so much criticized policy in an emergency, some system of military training and selection would have to have been in force before the war—what is now being attempted with the Officers Reserve Corps and other reserve training units. The inroads and losses from disease, often diseases not too serious in childhood, are mentioned, and improvements in medical science and sanitation have in our last three wars prevented much of this danger; so that the American people seem to have learned and taken to heart at least two of the lessons of the Civil War, confirmed in 1898 by experience in the Spanish War.

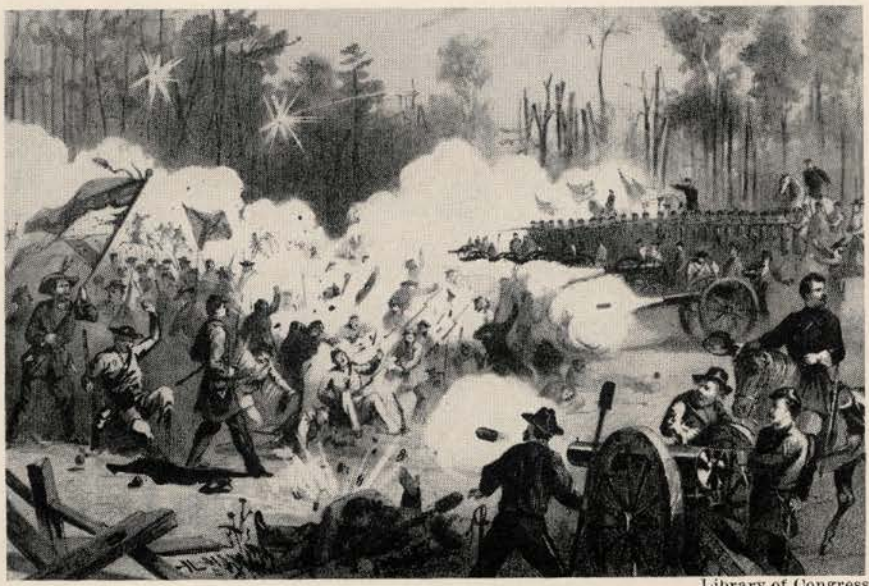
General Taylor's regiment was ordered to Virginia, arriving shortly after the first Battle of Manassas, and brigaded with three other Louisiana regiments under command of General William H. T. Walker. The description of and tribute to the latter is the first of those biographical outlines which add so much interest to this book. General Walker was soon transferred to a Georgia brigade and Colonel Taylor promoted and assigned to command the Louisiana Brigade. Lest this promotion be attributed to the favoritism of his brother-in-law, Jefferson Davis, he visited the latter to ask his reconsideration, but the promotion was confirmed. The Brigade participated in Jackson's Shenandoah Valley Campaign, and the confidence General Jackson came to have in its effectiveness is evidenced by the special assignments he gave it. "Stonewall" Jackson the man, especially his tactiturnity and reticence even when sitting with General Taylor for company around a camp fire, vividly emerges from the latter's description of this so famous campaign.

With Jackson he then participated in the Seven Days Battles and Malvern Hill. But here a recurrence of the illness, which had necessitated his taking a sick leave once before and had forced him to ride in an ambulance to husband his strength for an emergency for two or three days, afflicted him with temporary "paralysis of the lower limbs," and so he was constrained to retire for treatment to Richmond, where he was informed of his promotion to major-general and his assignment to command the District of Louisiana. Of the campaign just past he says: "The strategy displayed on the Confederate side was magnificent, and gave opportunity for resplendent success; but this opportunity was lost by tactical mistakes, occasioned by want of knowledge of the theater of action, and it is to be feared that Time, when he renders his verdict, will declare the gallant dead who fell . . . to have been sacrificed on the altar of the bloodiest of all Molochs—Ignorance." He had a good word to say for McClellan and his successful organization and training of the Army of the Potomac, in spite of interference by "the politicians and an ignorant and meddlesome Congress," and thought his selection of the peninsular route to Richmond wise. "During his operations on the peninsula and near Richmond, McClellan complained much of want of support; but the constancy with which President Lincoln adhered to him was, under the circumstances, surprising. . . . There was a moment (at Antietam), as Hooker's advance was stayed by the wound of its leader, when McClellan with *storgé* of battle, might have led on his reserves and swept the field. Hard would it have been for the Confederates, with the river in rear; but this seemed beyond McClellan or outside his nature. . . . While it may be confidently believed that McClellan would have continued to improve by experience in the field, it is doubtful if he possessed the divine spark which impels a commander, at the accepted moment, to throw every man on the enemy and grasp complete victory."

Of General Lee he says: "Of all men I have seen, he was best entitled to the epithet of distinguished; and so marked was his appearance in this particular, that he would not have passed unnoticed through the streets of any capital. Reserved almost to coldness, his calm dignity repelled familiarity; not that he seemed without sympathies, but that he had so conquered his own weaknesses as to prevent the confession of others before him. . . . Indeed, his character seemed perfect, his bath in Stygian waters complete; not a vulnerable spot remained: *totus teres atque rotundus*. His soldiers reverenced him and had unbounded confidence in him, for he shared all their privations, and they saw him ever unshaken of fortune." But the author does admit that "in both the Antietam and Gettysburg campaigns he allowed his cavalry to separate from him, and was left without intelligence of the enemy's movements until he was upon him. In both, too, his army was widely scattered, and had to be brought into action piecemeal."

Joseph E. Johnston he considers a master of logistics and the beau ideal of a soldier, "Brave and impetuous in action, he had been often wounded, and no officer of the general staff (sic) of the old United States Army had seen so much actual duty with troops. . . . Yet he cannot be said to have been a fortunate commander." And again, "I am persuaded that General Johnston's mind was so jaundiced by the unfortunate disagreement with President Davis, . . . as to seriously cloud his judgment and to impair his usefulness. . . . Having known him intimately for many years, having served under his command and studied his methods, I feel confident that his great abilities under happier conditions would have distinctly modified, if not changed, the current of events."

There is a great temptation to quote more of these personal sketches, but space limitations will not permit doing so. However, the following account of his first meeting with Jackson cannot be omitted: "The mounted officer who had been sent on in advance pointed out a figure perched on the topmost rail of a fence overlooking the road and field, and said it was Jackson. Approaching, I saluted and declared my name and rank, then waited for a response. Before this came I had time to see a pair of cavalry boots covering feet of gigantic size, a mangy cap with visor drawn low, a heavy, dark beard, and weary eyes—eyes I saw afterward filled with intense but never brilliant light. A low gentle voice inquired the road and distance marched that day. 'Keazleton road, six and twenty miles.' 'You seem to have no stragglers.' 'Never allow straggling.' 'You must teach my people; they straggle badly.' A bow in reply. Just then my creoles started their band and a waltz. After a contemplative suck at a lemon, 'Thoughtless fellows for serious work' came forth. I expressed the hope that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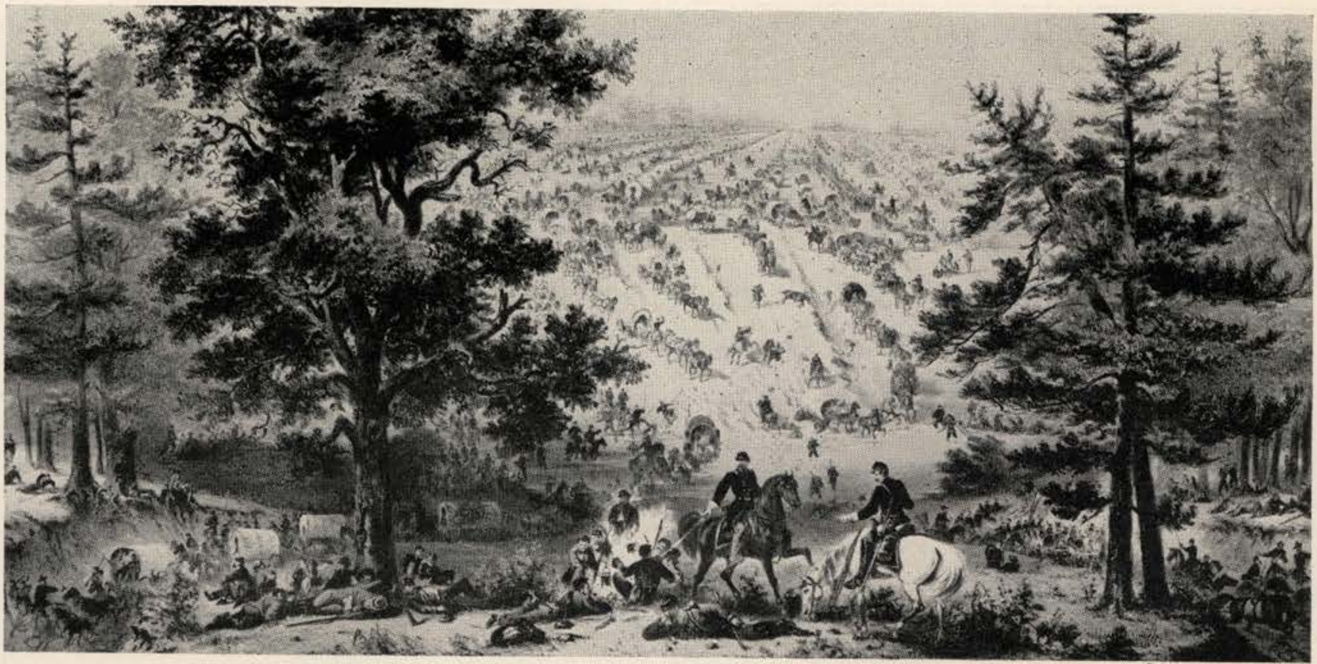
The Battle of Pleasant Hill.



Wagon Trains of the Army of the Potomac fording Bear Creek near Savage Station. Library of Congress

the work would not be less well done because of the gayety. A return to the lemon gave me the opportunity to retire."

In his Louisiana command, General Taylor, at home in the country, proved extraordinarily resourceful and successful, although unable to turn the tide of Union successes. He lived up to his own credo that "the value of initiative in war cannot be overstated. It surpasses in power mere accession of numbers." Contrary to his own belief that only trained soldiers knew the value of the offensive, he certainly had great initiative and ingenuity, although hardly a trained soldier himself. He developed a system for the attack of gunboats by riflemen and artillery on shore, that worked much damage to the Union river fleet, and in the end he was probably the one responsible for the fiasco of General Banks' Red River Campaign, and all of this in spite of the distress due to his son's death and the difficulties of his family in the war zone.

He is critical of Pemberton for allowing himself to be pushed into "the Vicksburg trap," disregarding the fact that President Davis had ordered him to defend Vicksburg to the last, and gives General Grant but faint praise "for promptly availing himself of his adversary's mistakes and vigorously following him." He does admit that Grant "made war in the true spirit of a soldier, never by deed or word inflicting wrong on non-combatants," regretting that the same could not be said of Sherman and Sheridan.

After the conclusion of the Red River Campaign, General Taylor sought relief from active duty because of physical exhaustion and spent several weeks with his family at Natchitoches. There news reached him of his promotion to Lieutenant General and assignment to command the Department of Alabama, Mississippi and East Louisiana. He again displayed energy, resourcefulness and good judgment, but with the limited forces available was not able to do anything effective to stay the fall of the Confederacy. On May 4, 1865, he finally surrendered to General Canby the last organized Confederate force east of the Mississippi. In his final order he gave his troops the sound and patriotic advice "to yield to the circumstances which surround them, and to honestly and faithfully perform those duties as citizens upon which must depend their future prosperity and happiness."

In the early days of Reconstruction he visited Washington to secure some amelioration of the conditions under which his brother-in-law, Jefferson Davis, was incarcerated in Fortress Monroe. While waiting for the permission from President Johnson "the officers of the army on duty in Washington were very civil to me, especially General Grant, whom I had known prior to and during the Mexican War, as a modest, amiable, but by no means promising lieutenant in a marching regiment. He came frequently to see me, was full of kindness, and anxious to promote my wishes. His action in preventing violation of the terms of surrender, and a subsequent report that he made of conditions in the South . . . endeared him to all Southern men." However, when later, as President, Grant felt obliged to sustain the government of Louisiana declared legally established, contrary to General Taylor's views, he (Taylor) became critical of the administration. But on the whole, considering the losses he had personally suffered because of the war, his remarks on the Reconstruction period are perhaps as mild as could be expected.

On closing this book one wishes there were more as vivid and sincere. The author's prejudices are so obvious as not to impugn his truthfulness, though he is sometimes mistaken; only the too frequent allusions to classical or historical persons and events, with which his narrative is interlarded and which imply a possible desire to show off his learning, detract from its interest.

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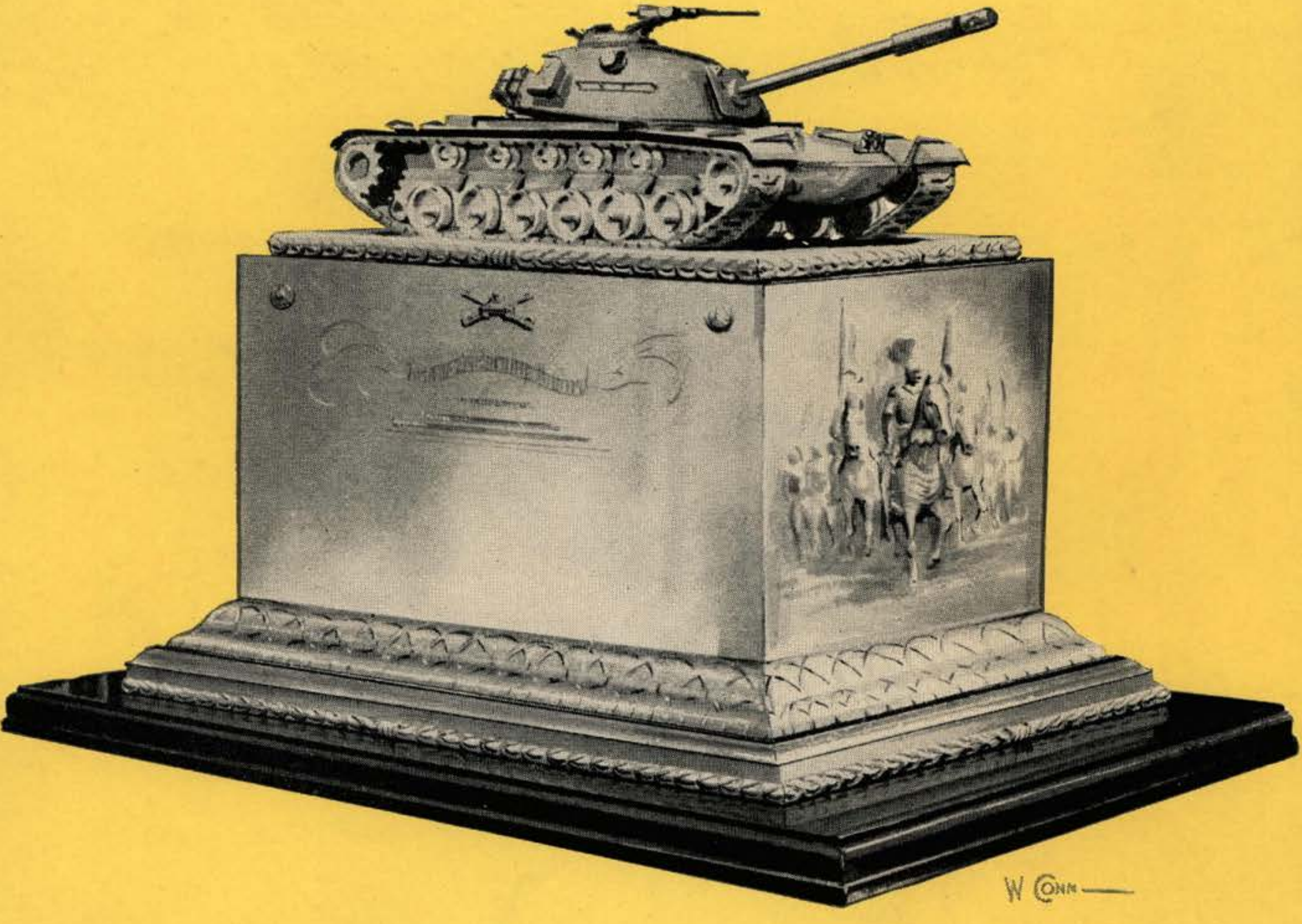

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(See page 7)

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LETTERS TO THE EDITOR

The British Magazine—*Soldier*

Dear Sir:

Your March-April issue editorial suggesting a new journal was of great interest to me. I have long considered our lack of such a magazine to be a melancholy omission. The British Army has that sort of magazine in its magazine entitled *Soldier*, which I unhestitatingly recommend to all who are interested in military affairs. It is somewhat more pedestrian than *Armor* and hence of wider interest. It tells in a language, every subtlety of which is immediately comprehensible since it is our own language also, of how other people run their army. The *Soldier's* subscription rate is extraordinarily low, something like ten cents an issue and it is worth every penny of it.

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Roy O. Manning
1571 East 19 St.
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Combat Tanker Badge

Dear Sir:

One thing in service that a man is proud of is his Service Ribbons or Decorations that a man may earn in the service. I have been in the service now for over 10 years and am very proud of the branch I am serving which is Armor. I served together with the Infantry and Armor in Korea as a Tanker. As we all know, the Tank-Infantry Team is of vital importance in our Army today. The Infantry has a way of rewarding their men in service by what is known as the Combat Infantryman Badge which they receive by going into action against a hostile armed enemy. But what about the Tankers that also enter into combat to serve their country? As it stands today there is no recognition as to a combat tanker. Couldn't something be done about this to help instill our pride as a combat tanker? I have heard that the Army was thinking along the lines as to adopting what was to be known as the Combat Tankers' Badge, but evidently nothing was ever put into effect along these lines. Does the Army at the present time have such a badge for the Tanker?

As we all know, the Infantry take great pride in their CIB and it makes their men proud to wear such a badge. I am positive that the Combat Tankers would feel the same way about a badge for their branch of service if something could be given to show that we served in combat as tankers.

Sergeant Ronald M. Schneider
Hq & Sv Co., 72d Tk Bn
Fort Lewis, Washington

- *This magazine has published many letters concerning this particular subject. To date the Army has not taken any positive action to alter this situation. The World Wars Tank Corps Association, under the guidance and leadership of their officers, successfully sponsored the Patton Memorial Stamp. Maybe they can generate the necessary spark to set the idea in motion to establish a similar award for Combat Tankers.*

Anyone interested in this project should contact Mr. Tom White, Editor of the Tankerine *and National Adjutant of the World Wars Tank Corps Associa-*

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Rates: See bottom of contents page.

tion, at 708 North Wallace Street, Indianapolis, Indiana.—EDITOR.

Re: The CMI

Dear Sir:

I have just completed reading an article in your November-December issue entitled "CMI." The author has certainly written a very accurate account of how these inspections are prepared and conducted. It was more than timely because we are expecting our CMI this next week. I believe that if it is posted on the bulletin board it may help us all to bear up under the strain. The term CMI seems to have been born here in Europe during the last few years. On arriving in my unit this past November, the place was in an uproar, or at least it seemed to me. They were undergoing a phase II inspection which was either a prelude to the 1956 CMI or a follow up of the 1955 CMI. All efforts since that time have been directed towards the supreme test which is rapidly approaching. As anyone could imagine, this steady buildup of pressure has affected morale to the extent that men feel that the more they put forth in effort, the more will be demanded. After this annual affair the sections breathe a sigh of relief and really go into a slump as far as training and maintenance are concerned.

The author did not mention the large scale requisitioning of parts prior to the CMI for items such as crash pads, etc., just so we have a voucher number to cover us for inspection; or the scrounging for paint. It is not uncommon to see a Captain or Lieutenant return from a neighboring unit proudly carrying a gallon of paint to be stowed under the desk until the week of CMI. Something is out of focus when officers and senior NCO's lose sight of our real mission in the Army and are reduced to the status of full time scroungers.

The annual CMI has replaced Organization day apparently. All events such as changes in command and leaves for key personnel are geared to this event, which should not be. The purposes of command inspections as defined in the regulations are ignored as it does not give an honest picture of the status of the vehicle maintenance or overall efficiency of the unit. However, it does identify the people who will crack under continual pressure and impossible conditions.

All in all I enjoyed the article and send my congratulations to the author.

MSGT. OWEN F. DEWSBURY
66th Tank Bn
APO 34, New York, N.Y.

Back Issues and Heraldry

Dear Sir:

Thank you for sending me a copy of the July-August 1954 issue of *ARMOR* to assist in completing my file. It arrived with the current copy. I am sure I lost track of my original copy during my change of station from Alaska to Fort Hood.

Would you be good enough to publish my request for the January-February 1947, March-April 1947, and November-December 1949 issues in the letters section? I expect they were worn out in use by members of the 43d Reconnaissance Company, Rhode Island National Guard, with whom I was working at the time as Unit Instructor. Since that time, the opportunity of having my *ARMOR* bound has arisen, and the receipt of the three missing copies would complete my file for the last nine years. I have tried the Command and General Staff College Library and advertised in the Fort Leavenworth daily bulletin without success.

I would like to propose the addition of a regular feature to the magazine, which would point up and highlight the traditions of our present tank and reconnaissance units. Devote one page of each issue to one unit, featuring the distinctive insignia, its heraldic description, the origin of the elements of the insignia, the campaigns and honors of the unit, and a photo of the present commander, brief description of present station and activities, and photos thereof.

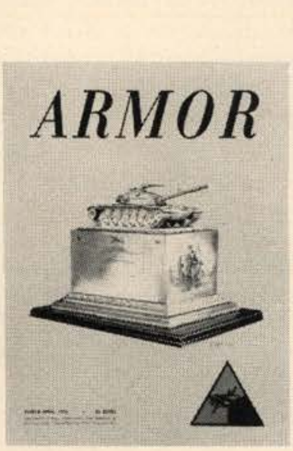
The idea is not original with me—one of the weekly semi-military publications carried out something of this type with some infantry regiments a number of years ago. With respect to the Infantry, the DA publication Lineage—Volume II is available. Volume III, Armor, is in preparation by the Chief of Military History at the present time, I understand.

The project need not be limited to presently active units; the units of the now disbanded reserve cavalry divisions, five or six, I believe, would further furnish material. If the insignia were printed in the proper colors, the presentation would be materially enhanced. Perhaps this might be restricted to yellow, red, blue, which normally appear on the cover at least. This might help keep the cost down. This would, I am sure, generate interest throughout the service, both individual-wise and unit-wise.

As a starter, for example, why did the old 14th Cavalry wear a bit of yellow ribbon with a navy blue stripe on each shoulder strap as the unit insignia? Does the 14th Armored Cavalry Regiment wear the same insignia as a lineal descendant? If not does any unit carry it now?

MAJOR H. F. WEHRLE, III
1203 S. Second St.
Leavenworth, Kansas

- *The 1¾ inch yellow ribbon with a ½ inch navy blue stripe in the center was designed and worn by the members of the old 14th Cavalry as a means of unit identification before distinctive insignias were authorized by the Army. This was not an uncommon practice as most of the active units of this time used some means of self identification. When the Army authorized the use of unit insignias, the 14th Cavalry submitted theirs and had it approved on 19 January 1923. A new metal Distinctive Insignia was approved for the 14th Cavalry Regiment on 30 April 1940. No other unit is entitled to wear the old insignia.* ED.



THE COVER

The drawing on the cover was one of a series drawn by Master Sergeant William M. Conn, Training Literature and Reproduction Department, The Armored School. Sergeant Conn prepared a series of pictures which were submitted to CONARC for approval of one for use in the manufacturing of a suitable trophy to be awarded the annual winner of the Armor Leadership Award.

Dear Sir:

From a personal standpoint this principally concerns memories—but I wonder why, in view of the great debt Armor owes to Cavalry and to Cavalry officers, former Cavalry officers are not included among those who are eligible to be members of the U. S. Armor Association.

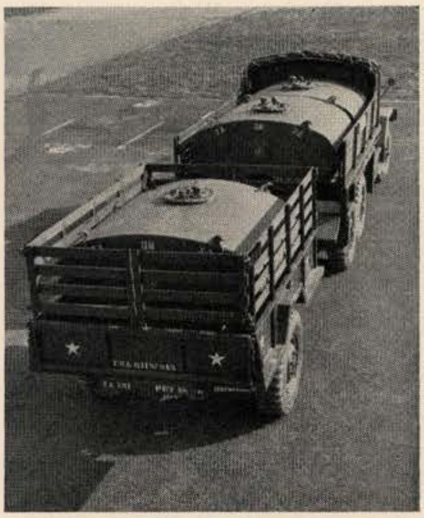
May I add that your Journal is interesting and valuable even though the horse almost belongs to history.

GENERAL CLARENCE LININGER
22 E. Old County Road
Mineola, L. I., N. Y.

- *See Reconnoitering in this issue.* ED.

BULK GASOLINE

U. S. Army



Seventh Army has replaced the method of "an empty can for a full can" by use of this 600 gallon gas container mounted on either M34 or M35 trucks.

By COLONEL E. F. STANFORD-BLUNDEN

This article was originally prepared for The Quartermaster Review *and is reprinted here with the kind permission of its editor. Slight modifications were made in keeping with the interest of our readers. The author is the Seventh Army Quartermaster.*

MODERN warfare is a battle of machines. Its essentials are machines, persons to control them and a constant flow of fuel to operate them.

During World War II, combat units in the European Theater consumed an estimated eighty times more gasoline than combat units in World War I. This tremendous consumption required multiple handling of small but heavy five-gallon packages, stockpiling at supply points and railheads, then further transportation by trucks and trailers to division areas.

In the early days of the Korean conflict, petroleum supply problems were considerably complicated. Military necessity dictated substitution for the more familiar but unavailable five-gallon cans of commercially available, harder-to-handle, 55-gallon drums.

The disadvantages of supporting modern army combat elements by the "package" method are too many for enumeration here. It is enough to say that such a system of supply, requiring tremendous quantities of gasoline, is slow, costly in manpower, immobile and inflexible.

Each new development in guns and vehicles since World War II has indicated a trend toward heavier equipment with consequent increase in the consumption of gasoline and allied petroleum products. This trend has boosted the operational requirement of motor fuel to a conservative estimate of five gallons per man per day. For a field army this presents a very obvious limitation to its combat potential. It has caused those charged with logistical resupply to look for a substitute or alternate solution to the "package" method.

Seventh Army recognized this need for a more efficient system to distribute bulk POL as far forward as possible, and when possible, the retailing of gasoline directly into combat vehicles. To do this, bulk handling facilities, particularly small tankers, had to be obtained to supplement the very limited quantities on hand. Satisfying this need with special-purpose vehicles presented many insurmountable obstacles, both operational and economic. It was therefore decided to experiment in order to find a more practical solution. These studies resulted in the construction of a 600-gallon capacity, skid-mounted gasoline container. Two of these containers were designed to be carried in tandem on either the M34 or the M35 truck and one on the 1½-ton trailer, with a truck-mounted power take-off gasoline dispenser.

The new improvised tankers comprise all the elements for successful achievement of a desired bulk petroleum dispensing system. They combine the desirable features of durability, low silhouette, flexibility, safety, ease of handling, simplified maintenance and economy of distribution from division level to individual unit vehicles.

The interesting background which led to the present combination of truck-mounted and tandem 600-gallon tanks, began as a direct result of an improvisation by utilizing the winch power take-off of a 2½-ton cargo truck to operate the pump. Using this means offered a fuel delivery potential equal to the M49 tanker without getting into the special-purpose vehicle class, since only slight modification of the 2½-ton cargo truck is necessary to accomplish the desired carrying and pumping capability. The additional use of a tank-mounted trailer increases this capability.

Currently, the equipment consists of the following:

1. A salvaged 30-GPM self-prim-

ing pump mounted on a base plate between radiator and bumper of a 2½-ton cargo truck which has had the winch removed. The base plate and bearing block were manufactured locally. The fan belts in the bearing block are standard ordnance items. The standard winch take-off assembly is connected to the pump assembly for operation of the pump proper. With the engine running at idle speed the pump discharges gasoline at the rate of 30-GPM. The pump suction hose follows along the frame of the truck and connects with the 600-gallon tanks on either the truck or the trailer, as desired.

2. The mounting of both tanks and pumps is a relatively simple procedure. Either or both may be dismounted from one vehicle and mounted on another in a relatively short period of time. Thus a 2½-ton truck may be used as a tanker, but retains its capabilities as a general purpose cargo vehicle.

3. The utilization of the winch power take-off to operate the pump is an improvised solution, but this standard equipment was available, whereas standard tanker pumps and power take-off units were not. A 60-GPM pump would be more desirable providing the strainers in tactical vehicles were redesigned to preclude splash back, which now occurs when they are refueled in excess of 30-GPM.

The advantages of this combination of the truck-mounted pump and the 600-gallon tanks are manifold.

1. It combines the features of a special-purpose vehicle without losing its cargo hauling capabilities.

2. It provides a cleaner fuel for using units.

3. It reduces wastage, spillage and evaporation.

4. It minimizes noise in combat areas.

5. It effects tremendous labor savings.

6. It considerably reduces requirements for 5-gallon cans in the can-for-can method of requisitioning.

7. It gives tactical commanders a hitherto unrealized combat potential.

8. It offers an efficient resupply method for peacetime garrison training as well as in field maneuvers and actual combat.

The Seventh Army's plan for utilization of the pump-truck combination was to place the pumps and tanks with using units, to be mounted on vehicles ordinarily committed to gasoline distribution. Bulk gasoline, then, would be brought by army controlled 5,000-gallon tankers to division distribution points where transfer into the 600-gallon tanks would be made. Then, in the hands of the using unit, it could be transported directly to vehicle tanks, or, if necessary, decanted into five gallon cans for kitchens and isolated detachments.

The 1½-ton trailer can be dropped at specified locations out of medium artillery range as reserve and for use by support units. Too, the refueling truck can return to this location, transfer the 600 gallons of gasoline from the trailer into its tanks and return within minutes to refuel vehicles in close contact with the enemy.

The portable tanks have been provided with still another most welcome feature, an inner lining impervious to the effects of aviation gasoline. Thus we can visualize either the truck or trailer-mounted tanks as a fuel supply source at light aircraft strips in the near future.

To determine appropriate methods for using this equipment, a plan was played administratively last July during CPX "Wolf Call." The play indicated a need for field exercise tests to determine the proper allocation and best method for using bulk gasoline equipment within a field army. It was decided to conduct these tests during FTX "Cordon Bleu" held in October 1955.

Selected armored, artillery and infantry type units operating with the "Cordon Bleu" Aggressor Forces were equipped with these experimental tank trucks from one to seven days preceding movement to test locations in the field.

The test was set up as follows:

1. Fifteen 5,000-gallon, semitrailer tankers were assigned to transport bulk gasoline from an Army Class III depot or bulk terminal. These tankers were to be under operational control of the Army Supply Point Commander and would move forward on his orders either from Depot to Army Supply Point or direct to Division Distributing Points. Gasoline was to be dispensed into the 1200-gallon tankers or into five-gallon cans.

2. Thirty-three experimental 1,200-gallon tank trucks were assigned to the units in the quantities listed in *Figure 1*. These tankers were to effect the maximum number of turn arounds between combat vehicles and Division Distributing Point and Army Supply Point. Transfer of gasoline from 5,000-gallon tankers to 1200-gallon tankers was to be expedited to the maximum, and the 1200-gallon tankers were to dispense gasoline direct into vehicle tanks or into five-gallon cans.

U. S. Army

Refueling two M75 Armored personnel carriers by 1200-gal. improvised tanker.

U. S. Army

The combination of truck-mounted pump and 600-gallon tanks reduces the requirements for the 5-gallon gas cans.

Based on test criteria, three methods of gasoline resupply were examined. They were:

1. Conventional package resupply.
2. 5,000-gallon tankers to five-gallon cans.
3. 5,000-gallon tankers to 1200-gallon tankers, to individual vehicle gasoline tanks and five-gallon cans.

Results reported by units testing the 2½-ton cargo truck modified with the 30-GPM dispenser and 600-gallon portable tanks, disclosed that over 69 percent of the total fuel used was distributed in bulk. The remaining 31 percent was furnished in five-gallon cans, much of this attributable to the unfamiliarity of unit commanders and the inexperience of operators.

An examination of the merits of the equipment used in the tests indicated the following:

1. Flotation on soft terrain would have been further enhanced, had M35 trucks been used rather than single wheel M34 trucks.
2. Location of dispensing pump at front of tanker simplified the problem of approaching combat vehicles in camouflage positions of refueling.
3. Equipment is simple and easy to operate.
4. The low silhouette of the tanker makes its identification as a tanker difficult. With tarpaulin cover it has the appearance of a normal 2½-ton cargo truck with winch.
5. Flexibility is a major advantage to the unit. Being a general purpose truck, it can be used as a cargo or personnel carrier when needed, or converted to a 1200-gallon tanker quickly, simply with the addition of the portable tanks.

The following additional conclusions were drawn from this exercise:

1. Fifteen 5,000-gallon tankers were more than adequate to support decanting operation at the Army Supply Point and Division Distributing Point and to simultaneously supply all 1200-gallon tankers assigned to the combat units during the maneuver.
2. When division has a requirement for canned gasoline, it is advantageous to fill five-gallon cans in the division area rather than draw full cans from the supply point.
3. Depot had only the smallest requirement for labor since it shipped only bulk gasoline to the supply point.
4. One hundred and twenty five-gallon cans can be replaced for each 600-gallon portable tank used. Replacement of additional cans for portable tanks will depend on the prescribed load now carried in five-gallon cans and the minimum cans considered necessary in each type unit.
5. Canned gasoline causes more engine failures than bulk gasoline.
6. Bulk gasoline can be supplied faster than canned gasoline.
7. When bulk gasoline is drawn by the combat unit, manpower is saved at all echelons, *i.e.*, depot, supply point, division distributing point, battalion or regimental service area, and with less fatigue to the individual vehicle operator or combat vehicle crew.

These tests have confirmed the soundness and practicability of a bulk gasoline delivery system. The 2½-ton cargo truck, combined with the 30-GPM pump and the 600-gallon tank, embodies the essential characteristics for refueling combat elements of a field army. It is the best approach to date for this purpose, utilizing a general purpose vehicle with a minimum of modification to furnish each unit with organic tankers.

In conclusion, we must emphasize that a satisfactory system of bulk fuel delivery is far more than the development of improved items of equipment. Basically it represents a radical increase in our combat capabilities, which must be exploited to the maximum degree. It opens new fields for tactical study and employment, which in turn suggests the need for a reevaluation of the logistical system, the auxiliary equipment essential thereto, training doctrine, administrative procedures and organizational concepts. The solution of these many implications and problems is our immediate concern.

Hq, Hq & Svc Co, 41st Armd Inf Bn	4
Hq, Hq & Svc Co, 29th Tank Bn (90mm)	8
Svc Btry, 14th Armd FA Bn (105mm)	2
Svc Co, 12th Inf Regt	3
Svc Co, 14th Armd Cav Regt	8
Hq, Hq & Svc Co, 373d Armd Inf Bn	4
Svc Btry, 288th Armd FA Bn (155mm)	2
Svc Btry, 290th Armd FA Bn (155mm)	2
TOTAL	33

Figure 1

Annual Report on the SIXTY-SEVENTH

MEETING OF THE UNITED STATES ARMOR ASSOCIATION

THE ORGANIZATION OF MOBILE WARFARE

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Major General John L. Ryan, Jr., Commanding General, TAC, greeting Secretary of the Army the Honorable Wilber M. Brucker upon his arrival at the 67th Annual Meeting.

Brigadier General Henry Cabot Lodge reviews the Honor Guard.

All Photos U. S. Army

Left to right: Maj. Gen. E. O. Wolf, NJNG, Lt. Gen. W. D. Crittenberger, Ret., Maj. Gen. R. C. Brock, NYNG and Brig. Gen. C. P. Kerr, TNG.

Left to right: General Jacob L. Devers (Ret.), General W. B. Palmer, Vice Chief of Staff, and Major General John L. Ryan, Jr., CG, TAC, involved in a friendly conversation.

Capt. J. A. Crowley, Board No. 2, briefs Maj. Gen. Robert L. Howze, CG, 1st AD and Maj. Gen. W. N. Gillmore, CG, 4th AD on equipment.

COL KEE
COL SCHLANGER
COL BOULGER
LT COL GRAYDON
LT COL RICHMOND
CAPT YEATS

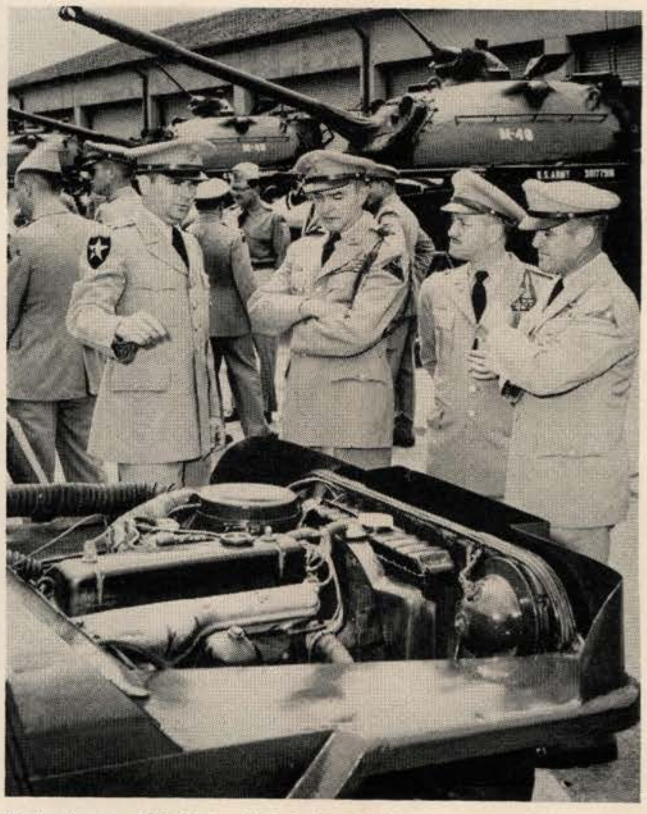
A panel discussion on "The Future of Armor," led by Maj. Gen. L. L. Doan, was one of the highlights of this year's annual meeting.

SEEN AT THE 67TH ANNUAL ARMOR MEETING

The photographs on these pages show some of the civilian and military figures, including retired officers, who were in attendance at The United States Armor Association's Annual Meeting. Other photos show members inspecting the equipment display which was excellently conducted by CONARC Board Number 2.

Lt. Gen. J. H. Collier, CG, 4th Army and Col. H. H. D. Heiberg, Ret., discuss armor equipment during their tour of the Equipment Display.

The Equipment Display by Board No. 2 was of tremendous interest to Association members as evidenced by this large group of visitors.



Maj. James M. Bates briefs Brig. Gen. Paul Disney, Asst. CG, 4th AD during his visit to the Equipment Display.

Secretary's Report on the

SIXTY-SEVENTH Annual Meeting of the U. S. Armor Association

INTO the pages of history we now include the historic 67th Annual Meeting of the United States Armor Association. In the store of memories we, the participants, can include the pleasure of renewing old acquaintances, the satisfaction of touching base with our home station—Fort Knox—and the honor of rubbing shoulders with many past and present Armor greats.

In addition to our principal speaker, the Honorable Wilber M. Brucker, the following outstanding personalities were present: Mr. George M. Chescheir, Civilian Aide to the Secretary of the Army, from the State of Kentucky; General Williston B. Palmer, Vice Chief of Staff of the Army, re-elected President of the Association; General Jacob L. Devers, Retired; Lieutenant General Edward H. Brooks, Retired; Lieutenant General Bruce C. Clarke, newly appointed Commanding General, Seventh Army; Lieutenant General John H. Collier, Commanding General, Fourth Army; Lieutenant General Willis D. Crittenberger, Retired; Lieutenant General Charles E. Hart, Commanding General, Second Army; Lieutenant General James M. Gavin, Chief of Research and Development, Department of the Army; Major General Ronald C. Brock, Commanding General, 27th Armored Division; Major General James F. Cantwell, Chief of Staff, New Jersey National Guard; Major General L. L. Doan, Chief, Armor Section, Continental Army Command; Major General Charles K. Gailey, Jr., Chief, Civil Affairs and Military Government, Department of the Army; Major General William N. Gillmore, Commanding General, 4th Armored Division; Major General Philip DeW. Ginder, Special Assistant to the Chief of Staff for Reserve Components, Department of the Army; Major General Thomas L. Harrold, Commanding General, III Corps; Major General Joe W. Henry, State Adjutant General for the State of Tennessee; Major General Hamilton H. Howze, Jr., Director, Army Aviation Division, Deputy Chief of Staff for Operations, Department of the Army; Major General Robert L.

Howze, Commanding General, 1st Armored Division; Major General Donald W. McGowan, Chief, Army Division, National Guard Bureau; Major General Gordon B. Rogers, Office of the Chief of Staff, Department of the Army; Major General T. J. H. Trapnell, Commanding General, 82d Airborne Division; Major General Edward O. Wolf, Commanding General, 50th Armored Division; Brigadier General Creighton W. Abrams, Office of the Special Advisor for Reserve Components, Department of the Army; Brigadier General Paul A. Disney, Assistant Division Commander, 4th Armored Division; Brigadier General Thomas N. Griffin, Chief of Staff, Second Army; Brigadier General Sidney R. Hinds, Retired; Brigadier General Clayton P. Kerr, Assistant Division Commander, 49th Armored Division; Brigadier General Theodore T. King, Chief of Staff, III Corps; Brigadier General Guy O. Kurtz, Retired; Brigadier General P. F. Lindeman, Chief Army Reserve and ROTC Affairs, Department of the Army; Brigadier General Henry Cabot Lodge, Reserve; Brigadier General Brainard E. Prescott, Assistant Division Commander, 27th Armored Division; Brigadier General Paul M. Robinett, Retired; and Brigadier General Maxwell Snyder, Assistant Division Commander, 48th Armored Division.

In addition to these off-post luminaries, the following on-post General Officers were present: Major General John L. Ryan, Jr., our genial host and newly-arrived Armored Center Commanding General; Major General John M. Willems, Commanding General, 3d Armored Division; Brigadier General Raymond W. Curtis, Assistant Commandant, The Armored School; Brigadier General Alva R. Fitch, Assistant Division Commander, 3d Armored Division; Brigadier General Samuel L. Myers, Commanding General, U. S. Army Training Center—Armor; and Brigadier General William H. Wood, Deputy Commanding General, The Armored Center.

The press was well represented, as was industry, thus showing an increased interest in our Army, Armor, the Association and what it signifies. Many of our armored division associations sent representatives, thus closing the bonds between our Association and veteran organizations which have an interest in Armor. All in all, it was the largest turnout to date. More than 200 off-post people came from around the globe to meet with us for this gala occasion.

CONARC Board No. 2 started off the program on Thursday morning with a display of equipment for all visiting members. New items of interest to Armored personnel made this trip to the board most enjoyable and profitable. After luncheon at the Country Club, we assembled at Gaffey Hall. The first hour was a forum on "The Reserve Forces Act and The Reserve Components Program." General Abrams, from the Army's Reserve Components Office, acted as moderator for this group. In addition to General Abrams, there were representatives from the National Guard, Reserve Components, the Training Center and other interested agencies tied into this program. By having such type men on the panel, we had people interested in planning levels down to and including the trainors who are at the operation level. Here we received first hand information on the program and its impact on the various sections at Fort Knox where it is being implemented. We also heard how it has affected the National Guard and Reserve. It is contemplated to present a full report of this forum in the July-August issue of *ARMOR*. Major General Ginder, who is Special Advisor to the Chief of Staff for this program, started the meeting with the results to date.

This session was indeed interesting as well as timely and served to stimulate all present with the problem on hand and what is needed to be accomplished by all of us in the fulfillment of this important Army mission.

The Armored School made the next presentation which was entitled "Armored Problem Areas." These four areas and the respective instructors who presented them were:

1. Armored Infantry and Reconnaissance unit organization, by Lieutenant Colonel James T. Burke.
2. Requirement for AAA weapons organic to the Armored Division, by Colonel Walter G. Hopkins, Jr.
3. Class III Re-supply in the Armored Division, by Major Robert L. Westbrook.
4. Defense by Armor, by Lieutenant Colonel Kimball R. Richmond.

These four problem areas were discussed in great detail, giving The Armored School's position in each of these four matters. In some cases there is a difference of opinion between the School, other schools and/or CONARC. All of these areas will be covered completely in the next issue.

The last period for Thursday was another forum which proved as interesting and informative as the other sessions had been throughout the day. General Doan, Chief of the Armor Section at CONARC, acted as moderator for a rather large but most distinguished panel whose subject of discussion was "The Future of Armor." Other members of the panel and their present organizations included:

1. Colonel Jack A. Boulger, III Corps
2. Colonel Walter G. Hopkins, Jr. C & S Department, TAS
3. Colonel John L. Lee, Weapons Department, TAS
4. Colonel Eugene C. Orth, CONARC
5. Colonel James H. Polk, 3d Armored Division
6. Colonel Lawrence W. Schlanser, Combat Developments Group, TAS
7. Colonel Ned T. Norris, Automotive Department, TAS
8. Lieutenant Colonel William A. Dwight, Department of the Army
9. Lieutenant Colonel Charles K. Graydon, C & S Department, TAS
10. Lieutenant Colonel Frank A. Penn, C & S Department, TAS
11. Lieutenant Colonel Kimball R. Richmond, C & S Department, TAS
12. Lieutenant Colonel James R. Spurrier, C & S Department, TAS
13. Captain Joseph J. Yeats, Jr., C & S Department, TAS

Some of the questions discussed during the forum were:

1. Reconnaissance agencies and the need for additional units
2. Armored division organization
3. Dispersion of units within an armored division
4. Possibility of an airborne armored division
5. Utilization of German personnel and their past experiences

As stated above concerning the other two periods preceding this forum, this will be covered more fully in the next issue.

Due to the fact that many visitors were unable to arrive prior to late Thursday evening, honors for all General Officers were not given until Friday morning. Immediately after the honors, the conference was officially opened in Theater No. 1. General Ryan introduced the Second Army Commander, Lieutenant General Charles E. Hart, who honored us with a few remarks. General Ryan next introduced our President, General Williston B. Palmer, who conducted the business meeting with the help of the Council and the Secretary-Treasurer.

Approximately 450 members were present for this business session, and 1576 more stationed around the world (whose duties prevented attendance) were represented by absentee ballots. The actual number in attendance was sufficient to meet the constitutional requirement for a quorum.

The reading of the minutes of the 66th Annual Meeting was dispensed with, in view of the fact that they had been published in the March-April 1955 issue of *ARMOR*. During the past several years, the Annual Report of the Secretary-Treasurer was read at this time. However, at our last Annual Meeting, the constitution was amended permitting us to hold the Meeting later in the year. By so doing, the Council voted to have the Annual Report prepared in January as in the past but to publish it in the March-April issue. Therefore, the Annual Report which appeared in the last issue was not read at this time.

The Secretary did give, however, a short summary for the first quarter of 1956 wherein he stated that business was slightly behind last year. This can be attributed to the fact that the Annual Meeting has served as a motivating factor in creating additional interest in the Association and its trade journal, *ARMOR*. It is believed that this line of reasoning will hold for this year and Association interest will increase. Worthwhile material has continued to be submitted for publication on a gratis basis which makes the magazine of particular importance to all Armored officers and units, regardless of component. It is hoped that all unit commanders will encourage their officers to become members and see that their units have copies of the magazine available for use of the non-commissioned officers in the dayrooms. Membership cards were issued with notices of the Annual Meeting. Effective the first of May, the offices were moved to 1757 K Street, N.W., Washington 6, D. C. The overseas advisory boards have continued to render their usual loyal support.

The next order of business was the election of officers. General Crittenberger, chairman of the nominating committee, assumed the chair. He discussed the proposed slate for the coming year. Prior to reading the names, he gave some of the motivating factors in selections by the committee. All Stateside Armored Division Commanding Generals were considered as musts for members of the Executive Council. In order to conduct business, many members were selected because of their present location near the Washington area. Chairmen for key overseas areas were also selected for advisory boards. The slate, as proposed, was carried unanimously.

General Palmer assumed the chair upon his reelection and expressed his gratitude upon being chosen to succed himself. He read a message from the President of the United States to the assembled group, and stated that other messages had been received from key commanders stationed around the world. These were posted on bulletin boards wherever Association members gathered and were read and enjoyed by all concerned. It is particularly noteworthy that our Commander-in-Chief took cognizance of our 67th Annual gathering. His message and others sent in by key commanders are published elsewhere in this folio.

General Palmer made special reference to the outstanding contributions made to the Association by General Crittenberger, and asked that the assembled group join in a rousing vote of thanks. There being no further business this portion of the meeting was adjourned.

We were fortunate to have the Secretary of the Army as our principal speaker. The Honorable Wilber M. Brucker was introduced to an assemblage of over 2,000 officers at Sadowski Field House by our Association President. His inspiring message "Teamwork—the Strength of the Army" also appears elsewhere in this folio.

Following lunch at the Country Club, the group moved to Dorret's Run. The demonstration was divided into six parts as follows:

1. Attack by tank platoon and armored infantry platoon
2. Firing demonstration by major self-propelled weapons of an armored division.
3. Firepower demonstration of combined tank and armored infantry platoons with normal supporting weapons.
4. A fly-by of all types of Army aviation in an armored division
5. Air Force demonstration of type planes and armament which furnish close ground support.
6. Tactical demonstration of a tank company attack reinforced by an armored infantry platoon, as part of a larger force, supported by conventional and atomic fires.

The participating units from the School Troops, members of the School staff and the elements of the Tactical Air Force are to be congratulated for an outstanding job.

General Palmer had asked his new Council to meet with him after the demonstration. At this initial Council Meeting, plans for the coming year were discussed. The Secretary reported on the status of various projects, such as awards for West Point, ROTC and OCS graduates. It was proposed that the Executive Council be expanded. This proposal will be discussed more fully at the next Council Meeting which will probably be held in the Fall.

In the evening, a reception and dinner was held at Cole Hall for all conferees and guests. This was indeed a fitting climax to a full day schedule. General Ryan introduced various members of the press who were present. General Palmer officially closed the meeting. However, he asked for a rising vote of thanks to Colonel Henry C. Newton, Director of Instruction at the School, who had acted as general chairman for the meeting. Due to the fact that he had performed in this capacity for the past several years, and prior to next year's meeting he would retire, this was indeed a fitting and worthy tribute.

Plaudits are due to everybody at Fort Knox who worked so diligently to make this 67th Annual Meeting such a great success. From the time we landed at the front gate until we left, nothing was too great or too small. As stated last year—and it deserves reiteration—they made us feel that we had really come home, which we had, for Fort Knox is the home of Armor.

from the President of the United States

The White House, Washington, D. C.

General Williston B. Palmer

President The U. S. Armor Association

TO all attending the Sixty-Seventh Annual Meeting of The United States Armor Association I extend greetings and best wishes.

During the Association's long history its members have been noted for their pioneer spirit and for their leadership. It is encouraging to realize that members of The United States Armor Association, with their great fund of experience, are among those whose wisdom the nation can rely upon to aid it in the vitally important business of national defense.

DWIGHT D. EISENHOWER

U. S. Army

THE HON. WILBER M. BRUCKER
Secretary of the Army

The Principal Address before the U. S. Armor Association's SIXTY-SEVENTH Annual Meeting

TEAMWORK The Strength of the Army

IT is inspiring to be here at Fort Knox, and to meet with leaders of our Army, and, in particular, of our armored striking force, which is so important an element of our great Army team. I emphasize the word "team" because consummate teamwork all along the line—as you have so often demonstrated in the fires of war—is the keystone of the Army's ability to discharge its tremendous responsibilities for the defense of our Nation.

I am reminded of a verse of the well-loved "Caisson Song":

"Cavalry, boot to boot,
"We will join in the pursuit,
"While those caissons go rolling along."

The spirit expressed in those lines, with their nostalgic flavor of the old Army, must always be the ruling spirit of our new Army—the Army of Tomorrow—firmly joined, man and man, arm and service, in the pursuit of a common purpose.

We must not make the disastrous mistake of underestimating the task that faces our Army today. Despite the ostensible "new look" of the communist conspiracy—its freshly gilded promises and tawdry smiles, its artful retreading of belligerence into benevolence—there is not the slightest evidence to justify a belief that the communists have modified in any degree their ruthless determination to subjugate the entire Free World by whatever means they can. Backing that determination is the steel of the largest mobilized armed forces on earth—growing in size and power with each passing day.

"The vast Soviet military establishment has not been scrapped," President Eisenhower warned America only a short time ago. "On the contrary," he said, "the Soviets and their communist allies are increasing the strength and effectiveness of their armed forces, and are providing them with equipment of the most modern design. The threat implicit in this vast aggregation of military power still casts an ominous shadow over the world."

The United States Army is a vital part of our defense against this massive threat. It is the hard core of our security. It is a central element of the greatest system of collective protection against a common foe that has ever been created—a system in which our country is now associated with 45 other nations.

OVER 40 percent of our troops are deployed overseas in 73 countries in support of our global commitments. In Europe and Asia—standing guard with the troops of our allies—they form tangible barriers to any aggressive moves by the vast armies of Soviet imperialism. These men in the Army uniform constitute visible proof to the leaders of the communist conspiracy that we mean exactly what we say—that we steadfastly intend to resist aggression in

The United States Armor Association was indeed fortunate in obtaining the Secretary of the Army to deliver the keynote address to the assembled gathering at our Annual Meeting. It is hoped that all our members, unable to be with us at The Armored Center, will read this outstanding presentation and glean as much wisdom from his words as did we who were present.

any form. Their mere presence stimulates the morale and stiffens the resolution of our friends by constantly reminding them that we are in this together, and that we intend to see it through together—come what may. In addition, our Army is helping to train more than 200 allied divisions, a very substantial portion of the Free World's collective strength.

The paramount purpose of our whole defense team is to deter aggression—to prevent war—but we know that in order to be an effective instrument of deterrence, it must be prepared to fight and to win under any circumstances. The evidence of its ability to do so must be so clear and so convincing that a potential enemy cannot fail to realize in advance that resort to armed attack would prove to be a most costly mistake.

IF it should come to actual fighting—if our best efforts to prevent the outbreak of war should prove futile—the major combat burden would sooner or later fall, as always, upon our ground troops. No technological advance has diminished their importance. Weapons, equipment, and tactics have all been revolutionized more than once in the forty years since I slogged through the mud of France in World War I with the Rainbow Division, but the fundamental role of the Army, as we knew it then, has never changed. It is the component of the defense team which has the means and capability needed to gain and to maintain control over an enemy's land, his resources, and his people—in other words, not merely to wreak destruction upon him, but actually to conquer him, which is the ultimate wartime goal of all military action.

Since the days of the cave dwellers, men have been devising new, more ingenious, and ever more lethal weapons of war with which to extend their capabilities, but nothing has yet been devised to replace man himself. As long as man lives on the land, and depends upon it for his sustenance, final victory in any military conflict will have to be gained on the ground. It will be gained by men who meet the enemy face to face and dig out the very roots of his resistance. The notion that wars can be won by remote control—with pushbuttons—is a dangerous myth. If encouraged it can lead only to psychological, spiritual, and downright physical unpreparedness for the realities of military conflict.

IN the event of war—no matter what kind of a war it might be, no matter what might transpire in its initial stages—our Army must be ready to play its full part as a dominant force. It must be prepared to fight successfully against any aggressor, any time, any place, and on any terms. It must be capable of fighting an all-out war. It must also be capable of coping with an urban riot, a remote brushfire war, an attempted seizure of power through military pressure, or any other device of military aggression contrived by the communist mind. It must be equally as ready to fight a war in which atomic weapons are used, or are not used. In short, it must never allow itself to become irrevocably committed to any one concept of war, to any particular family or type of weapons, or to any inflexible tactical doctrine.

The ability of the Army to carry out its mission successfully is one of the most important measures of our national security. As members of the Army, we can be proud of what is being accomplished throughout our whole organization to make it ready for whatever tasks, of whatever magnitude, it may face in the critical years to come. We can see on every hand the results of dynamic thought, unremitting research, and positive, energetic action within every branch of the Service, which will give the Army as a whole the means to be the fastest moving, hardest hitting Army in the world—a military force of incomparable power and versatility—a reliable and ready Army which is an indispensable part of the Nation's first line of defense.

Major emphasis is being laid at the present time upon the development of atomic weapons precisely tailored to the Army's needs. Weapons of this nature now in the hands of using units—the CORPORAL and the HONEST JOHN—give us a valuable interim capability, but they constitute only a beginning. In the not-too-distant future we will have whole families of guided missiles, ballistic missiles, and rockets to supplement the big guns with which our troops are armed. They will give our artillery the vastly increased range and effect necessitated by the requirements of the huge atomic battlefield. One example is the 1,500-mile IRBM JUPITER, which is now being developed jointly by the Army as a ground-launched weapon, and by the Navy for surface ship and submarine use. We are making such substantial progress with this high-priority project that the time necessary to develop the range we seek, coupled with the accuracy we have already attained, will be cut to a minimum. Units are being organized to utilize the shorter-range REDSTONE, the accurate experimental vehicle leading to JUPITER.

We believe that we should have in our arsenal an adequate supply of atomic weapons which can be used with discrimination against close-in as well as distant pinpoint targets, with complete accuracy under the most adverse conditions of weather and visibility. They will make it possible for us to support our troops adequately under any circumstances without unnecessary wholesale destruction—without the annihilation of large segments of the population—which might well be a friendly population—within an area of combat.

We are not overlooking the importance of intensified research and development in the field of non-atomic weapons as well, because they are urgently needed for a great many specific tasks, and will be for as long as we can foresee. We will never turn our backs upon any weapon or family of weapons until we have something definitely better in every important respect which performs the same function. We must always insure that the Army has the means at hand to apply the exact amount of force required to deal with every situation—from the silent thrust of a bayonet to the detonation of the most powerful guided missile.

THE attainment of maximum mobility, both tactical and strategic, is one of our primary objectives. It would be a prime factor of success in any war we might have to fight. The traditional ground mobility and tremendous shock power of Armor take on new significance in the light of the requirements of the atomic battlefield. Armor will play a very important role in any war of the future. However, all elements of the combat commands of the atomic field army—Infantry, Engineers, and all forms of Artillery, as well as Armor—must be able to move swiftly to the attack from dispersed positions in order to exploit to the full the effects of our atomic firepower. Faster, lighter, more versatile ground vehicles are being provided to give them that capability. Air vehicles—including the "Flying Boxcars" which drop our paratroopers, the new assault transports which can land Infantry on any reasonably level field, the Army's own organic helicopters which can put down men and supplies on the roughest and most inhospitable terrain—all these are literally giving wings to our ground troops.

In order to carry out its mission successfully, the Army must also be able to transport its major units by air over long distances, between continents and across oceans. We have made considerable progress in attaining that degree of mobility. We know, for example, that if the need arose and we were assigned the requisite transport aircraft, we could fly an entire airborne division, together with its essential automotive equipment and organic artillery, from the United States to any part of Europe or Asia. We could get it there in time to dominate a dangerous situation before it got out of hand. We look forward to the time when it will be practicable to move Armored units with equal facility.

A HIGH priority undertaking to which it is imperative that the whole Army address its best efforts is the building of an adequate Reserve. The Armored Center has played an impressive part in the Reserve program. Due in large measure to the accomplishments of the officers and men here at the home of Armor who participated in the training of the first experimental UMT unit in 1947, a ground swell of sentiment in favor of more widespread military training along the lines contemplated by the Congress when it originally passed the Universal Military Training and Service Act began to develop. Now we have the Reserve Forces Act of 1955, with its six-months' training feature, which for the first time provides a definite and equitable means of building a strong, vitalized Reserve. Again the Armored Center is doing a splendid job in training many of the young Americans who have enlisted in the Reserve under this program.

Military Reserve Week, which is being observed throughout the country this week, is helping to focus the attention of the nation upon the intensive efforts being made to build up our vital trained and ready Reserve Forces—both the Army Reserve, and our splendid National Guard, the backbone of our Reserve strength, which now numbers over 400,000 well-trained and well-equipped troops of high morale, and is growing rapidly. Already more than 28,000 young men have enlisted in the Army Reserve, and they are coming in at the present time at a rate of over 1,100 a week. It is proving to be something that appeals to young Americans, and those I have observed in training in various camps are making splendid soldiers, fully worthy of the honored uniform they wear. The program is rolling, and it is up to all of us to put forth every effort to keep it rolling, and gathering momentum. The success of this program must be a prime concern of every member of the Army.

IT is going to take teamwork of the finest kind to accomplish all the tough and tedious tasks that lie ahead of us today. I recall the story of a small attack group of the 25th Division which was working its way up a hill in Korea toward a platoon objective. A private who was leading the group used up his grenades on an enemy foxhole halfway up the ridge, and yelled for others in the group to pitch him some more. Working together with the precision of an infield tossing the ball around, they kept him supplied through the air. The group advanced in short bounds with perfect coordination. The leader would catch a grenade, pull the pin, and throw it. The group dropped flat until it exploded, and then tossed him another grenade, and the action was repeated. Eventually, the group successfully fought its way to the top of the hill. The whole maneuver was perfectly executed because these were good soldiers who quickly grasped a situation and knew how to work together as a team to achieve their objective.

This epitomizes the team spirit which must permeate the Army at all levels of command. Teamwork does not mean merely cooperation. It involves a far closer welding of purpose and effort, a true yielding of the individual point of view to the success of the team as a whole.

During this critical era, the ability of the Army to do its job is of especially grave consequence to America. Every person connected with it owes no less than undivided allegiance to the team. Each of us must have a spirit of unqualified dedication, and singleness of devotion to this great Army that will stamp us as worthy in the tremendous days that lie ahead. Every job and every branch is of great importance. I served as an Infantryman, and I am proud of the Infantry, but I am sure it would not accomplish very much without the rest of the team solidly behind it.

There is no room anywhere within the structure of our Army for any narrow self interest which subtracts from the effectiveness of the Army as a team. I am by no means selling honest competition short. Competition is highly commendable when it impels a man or an organization to do the best possible job—to outstrip all others in excellence of performance.

The professional associations of the several arms and services—such as your Armor Association—have, through the years, zealously promoted this branch competence and contributed substantially to the effectiveness of the Army as a whole. There is a real and continuing need for them. There is also a challenging need—well expressed in an editorial in your magazine, *Armor*, which recently came to my attention—for a dynamic association, composed of members of all branches, which can and will speak with one powerful voice for the entire Army, and help to tell the Army's story to the Nation. All of us, both individually and collectively, have a solemn and inescapable obligation to the American people whom we serve to be as articulate as we possibly can—to make crystal clear the cold facts about military security as we know them so well—to spell out the vital part the Army team is playing in the attainment of our national objectives. With a view to filling the need you have recognized for an all-inclusive organization, the Association of the United States Army was formed some months ago to provide a common meeting ground for the combat arms and technical and administrative services. It seems to me that if the Armor Association were to join forces with it—without of course, losing its separate identity as a professional Association—the attainment of that one voice we all so earnestly desire would be brought one long step nearer.

The Army has a tremendously important job, a job it is fully capable of doing, but we must continue with unflagging zeal to seek improvement all along the line. This is the forward-looking, and forward-thinking Army of Tomorrow—and we must keep it so. We respect the past. We derive inspiration from countless examples of the courage and devotion which have made the Army great, but our watchword must always be: "Forward."

WE must be ever ready and willing to cut a new pathway through any jungle growth of custom, of precedent, or of tradition that blocks the march of true progress. The Army team has a splendid example of forward-thinking in the person of Armor's own George Patton. The foresight, strength, and determination which were so characteristic of the soldier whose creed was "In yourself demand the impossible" are doubly essential today. We must ever press on toward higher and seemingly impossible goals. We can never reach so lofty a plateau of accomplishment that there will not be looming above it another challenging mountain. There is a proverb that says: "An army is maintained for a thousand days so that it may be used on one particular morning." Each of us has a vital responsibility to make certain that if the particular morning should dawn when the United States Army must fight again in defense of this Nation, it will be ready.

Salutes from around the world

On behalf of the other soldiers of the United States Army I extend best wishes to the United States Armor Association on the occasion of its 67th Annual Meeting. I am confident that your 1956 meeting will heighten the interest of all members in current affairs pertinent to Armor and the Army.

The Army's heaviest striking power is vested in Armor, which combines mobility, strength, and speed to render war quickly won. As an arm of decision and decisiveness, Armor constitutes a vital element of the military strength of the Army—an Army dedicated to the deterrence of war or to victory, should conflict occur.

I heartily endorse the efforts of the Armor Association to advance the technique of mobile warfare.

MAXWELL D. TAYLOR
General, USA
Chief of Staff

On behalf of the officers and men of Seventh Army, I am pleased to send greetings to the members of the U. S. Armor Association and to extend best wishes for a successful meeting.

It is doubtful if the Association ever convened at a time when the subject of Armor is more alive than today. New developments in organization and equipment call for a corresponding re-evaluation of tactical doctrines. I can think of no group more qualified to successfully resolve these problems than the members of the U. S. Armor Association. Your response to this challenge may well chart a course for armor in warfare as revolutionary as that which marked the innovation of the tank.

I am confident that the deliberations and efforts of this 67th annual meeting of the Association will result in continued emphasis upon armor and the importance of its role in modern warfare.

H. I. HODES
Lieutenant General, USA
Commanding General Seventh Army

In these days with everyone so preoccupied with the concept of winning wars with guided missiles, it is well to keep a few fundamental facts in mind.

No battle has ever been won until the principal objectives were occupied and no war or major campaign has been considered terminated until the conqueror has control of the loser's territory. Control means physical occupancy.

While integrating guided missiles, rockets and other atomics into its supporting weapons system, Armor remains as the mobile combat arm essential to rapidly gain control of vital areas of the enemy's territory. To do this, it must not only close with the enemy forces in battle but it must move quickly to seize terrain vital to success before the enemy can do so.

All officers of our modern Army must understand the concepts for the employment of Armor in order to take advantage of the characteristics which make it the *mobile combat arm of decision.*

My very best wishes to all members of the Armor Association assembled for their 67th annual meeting at the "Home of Armor."

I. D. WHITE
General, USA
Commanding USAFFE and Eighth U. S. Army

In this time when so many eyes are focused on intercontinental missiles, the future of Armor presents a challenge to each of us. It is up to all of us who have been and are intimately aware of Armor's importance to insure that it is never forgotten. The U. S. Armor Association has taken up the challenge. Its efforts merit fully the continued support and advanced thinking of all of its members. My very best wishes for a successful and profitable 67th Annual Meeting and my sincere regrets that I cannot be with you.

EDW. G. FARRAND
Major General, USA
Deputy Chief of Staff
Hdqs USAFFE and Eighth Army

ARMOR experienced officers and men of the Military Assistance Advisory Group-Japan join me in sending greetings to the Association on the occasion of its 67th Annual Meeting, at Fort Knox. We regret that none of us can be with you, other than in thought.

My service here, in this potentially-strong Free-World security bastion in the Far East, has reinforced my conviction as to the importance of Armor as a member of the Army team. I wish continued success to the Association in its aim of fostering interest in the mobile arm of decision and of disseminating knowledge concerning it.

WILLIAM S. BIDDLE
Major General, USA
Chief MAAG-Japan

IT is indeed with regret that the demands of my present assignment make it impossible for me and three of my staff to be among you today. We enjoy being with men of Armor —there is a certain alacrity, an eager enthusiasm to improve upon the old, to try the new, and plan for the future that quickens both the heart and mind. We are extremely fortunate, we feel, to have such a fine organization to work in our interest. We must keep it.

With the world situation what it is today, and with the development of new, bigger, and more devastating weapons, the role of Armor in war becomes increasingly vital and important. There is no other combat arm that has the mobility to deploy, regroup, strike, and destroy the enemy; that has the fire power to make its own penetration; that has the shock action to overpower and secure the victory. Armor has a great future.

JOHN K. WATERS
Major General, USA
Chief MAAG-Yugoslavia

I EXTEND my best wishes for a successful and profitable meeting of The U. S. Armor Association.

GEORGE W. READ, JR.
Lieutenant General, USA
Commanding General, ALFSE

IT is with deep regret that I find my assignment here in Tokyo prevents me from joining you and my associates at the 67th annual meeting of The United States Armor Association.

The need for extended recognition of the capabilities of modern Armor was never more important than today when so many untested and untried solutions to seek an easy and early victory are being promoted. The inherent characteristics of shock action, heavy fire power, and great mobility leave armor still without a peer in the ground battle. The advances that will continue to be made in our tactics and techniques as well as in our equipment will assure the effective employment of armor in substantial quantities unless we are too late in providing it.

The development of the area of the Middle East as a possible future field of major conflict only accents the need for and capability of armor to successfully exploit situations arising in such terrain. The use of the Armored personnel carrier as employed in a small way by my division in the closing days of combat in Korea convinces me more than ever the integrated Armor team, equipped with the latest devices and with techniques adopted to meet modern requirements on the battlefield, provides us with a superior offensive capability without regard to what type of weapons may be used against us.

I know that as the result of the annual meeting a new stimulus will be felt by those present and I hope that it can be disseminated to all others whose support is essential if Armor is to be accorded the recognition for future combat.

With highest regards and best wishes to all.

ARTHUR G. TRUDEAU
Major General, USA
DC/S, Plans, USAFFE

ALL best wishes to The U. S. Armor Association for a fine meeting and the continued progress of the Arm of Decision.

JAMES I. KING
Brigadier General, USA
C/S, MAAG-Korea

IT is a pleasure to extend my greetings to all of you on this occasion of the 67th annual meeting of the United States Armor Association. Although my present assignment makes it impossible for me to be with you, I am keenly interested in the progress of this year's conference.

Armor plays a vital role as the "mobile partner" of a combat team faced with modern concepts requiring increasing flexibility.

By providing information, an exchange of ideas and experiences, and an opportunity to renew our associations I know that our annual meetings make a decided contribution to the effectiveness of the combined arms team.

I extend to all of you my warmest personal regards and best wishes for a profitable meeting.

C. P. BIXEL
Brigadier General, DC/S
USAFFE & Eighth Army in Korea

Continued on next page

The activities of The United States Armor Association have done much to keep personnel of the 2d Armored Division abreast of the latest developments in the weapons, equipment, and tactics of Armor. On the occasion of the 67th Annual Meeting of the Association we extend greetings to all former commanders and members of the 2d Armored Division and best wishes to all for a successful gathering.

C. STANTON BABCOCK
Brigadier General, USA
Commanding General
2d Armored Division

As you are well aware the week 22-28 April has been set aside as Military Reserve week. Due to my position as co-chairman of the sponsoring organization, The National Security Committee, I am unable to be with you for this historic Sixty-Seventh meeting of The United States Armor Association. My best wishes to all present for a successful and profitable gathering. I am confident Armor will continue to be held in its present high esteem.

HARRY H. SEMMES
Brigadier General, USAR

Greetings from the armor officers assigned to this Detachment to the members of the Armor Association who will attend the annual meeting at Fort Knox on 26-27 April 1956.

EDWIN H. J. CARNS
Brigadier General, USA
Commander Det. L (Prov), 8202d AU

I should like to extend the best wishes of all members of the 14th Armored Cavalry to The United States Armor Association on the occasion of its annual meeting at Fort Knox, Kentucky, during the period 26-27 April 1956. I am confident that these meetings have done much to keep Armor abreast of our new concept of war and have aided materially in our present flexible organization and doctrine.

Though it is impossible for me or any member of my command to attend, you may be assured we shall be following with great interest the developments in Armor which will occur there.

LEMUEL E. POPE
Colonel, Armor
Commanding 14th Armored
Cavalry Regiment

On the occasion of the 67th Annual Meeting of The United States Armor Association, I wish to extend the best wishes of the officers and men of the 4th Armor Group for a most successful and profitable assembly of the leaders of our branch.

The 4th Armor Group is most appreciative of the many benefits derived from these Armor Association meetings and will await with much interest the decisions which will be forthcoming.

In all the Group's activities, we have leaned heavily upon the policies and information promulgated within the pages of "Armor."

HARRY L. KINNE, JR.
Colonel, Armor
Commanding 4th Armor Group

Best wishes for a highly successful Sixty-Seventh annual meeting of the organization of mobile warfare.

WILLIAM G. BELL
Major, Armor
Former Secretary
U. S. Armor Association

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The press recently has devoted a great deal of space to the guided missiles question. Pros and cons concerning the proper methods of employment and by what service have created an air of confusion. To the layman it must appear quite baffling, to say the least. To the military man it undoubtedly must create a certain area of speculation as to who, what, why and where. However, it is believed that this air of confusion is a natural evolution and it is not meant as criticism of any particular group. It is natural for our technological processes to advance ahead of our thinking along the lines of methods of employment and organizational capabilities. To reverse this process would be to put the "cart before the horse." Before we can positively come up with the answer as to the methods of employment and types of organization, we must have the instrument to be so employed. We must know the weapon's capabilities before we can evaluate how it is to be utilized.

The Army has been in the ballistics missile business for a long time. It has had the research, development and production responsibility for all Army and Air Force World War II ballistic type missiles, i.e., shells, bombs, and still has today in the conventional ballistics category. Further, ballistic type missiles have been breaking the sound barrier for the past fifty years, whereas piloted aircraft have accomplished this just since 1947. Ballistic type missiles such as the Nike, the Honest John, the Corporal and the Redstone are often given the false misnomer of being air-type or flying type missiles. Hence the public in general believes these missiles are the responsibility of the Air Force. Nothing could be more erroneous. It is easy to differentiate between a bird and a bullet. The bird or wing typed missile such as the long range strategic Snark and the short range Matador is the logical outgrowth of the piloted wing type aircraft and logically falls in its rightful place to the Air Force. However, ballistic type missiles which are an outgrowth of bullets have always been an Army responsibility. Because of the Army's experience in research, development, production and employment of this type missile it would seem plain as a pikestaff that the Army would play a paramount role in this field. Sometime ago our Secretary of Defense stated that as new weapons became available it would be necessary from time to time to reevaluate the various roles of the services. It would seem that the time is rapidly approaching.

In order to put this guided missile program in its proper perspective, it would be well to analyze the Army's mission and its requirements for ballistic type missiles. We stated in our editorial in the January-February 1956 issue of ARMOR that "the mission of the Army is to defeat enemy forces in land combat and gain control of the land and its people." With the ever-present Communist threat, the Army is required to maintain forces in being in order to:

1. Deter general war,
2. Deter local aggression,
3. Defeat local aggression; and
4. to be capable of rapid expansion into forces necessary to deal with any war.

The Army needs various kinds of missiles to perform its mission. It needs surface to surface missiles for a short range assault, or demolition guided missiles to be employed against enemy Armor and fortifications. It needs surface to surface missiles to extend the range of existing artillery, to cover the increased depth of the battle area. It needs a long range missile to support deep penetrations and effect deep interdiction, thus isolating the enemy's front line units. The Army's surface to air missile requirements are mainly for antiaircraft defense of all types of enemy aircraft and for anti-missile defense. The Army also has a need for a reconnaissance type missile to collect intelligence data over extensive and radioactive areas.

It is well to point out that the Army has already developed, and has in the hands of troops most of these types of guided missiles required for any type war, be it of a general nature or a local skirmish. To improve these missiles for accuracy and distance is an ever-pressing problem. To improve the methods of employment so as to assist the ground troops in their mission of closing and destroying the enemy, rightfully should be an Army problem. To divide this responsibility between two or more services would be to weaken our hand. (By *our,* I refer to the Nation, not to any one service.)

There is nothing immutable in our Department of Defense. However recently the structure might have been developed for the situation at that time, new weapons bring on new concepts and new organizations. The sooner our existing organizations are tailored to our new concepts and new weapons the better equipped we will be to meet whatever exigency might confront us.

The ability to succeed in land warfare is not only the responsibility of the Army but is a national requirement. It undoubtedly could be the decisive factor in deterring or winning any type war of any proportion. The Army has been in the business of winning land wars since the birth of our illustrious Nation. To continue successfully in business means the freedom of our Nation and the rest of the free world. To fail means dominance by unscrupulous, tyrannical dictators.

Maintenance in the Modern Army

"If we are to make the most of our modern weapons, maintenance must keep pace with technical development."

THE blinding light of Hiroshima and Nagasaki, AD 1945, revealed an unready world on the threshold of *the atomic era*. Little more than a decade later, atomic fission has successfully triggered thermonuclear fusion and the world is thrust further toward the unknown. The release of the energy hitherto locked in the atom has revolutionized human thought in many fields.

Only recently has man begun to realize that he is living in a greater age, of which *the atomic era* is only a part—*the age of automation*. To speed the mathematical calculations leading to the successful detonation of an atomic bomb, scientists devised the electronic computer, an ingenious marriage of the lectron tube and the servo-mechanism. That wedding has produced other devices which push the frontiers of science even further forward. Automatic factories turn out completed, packaged products with little more human supervision than the flick of a switch. Freight cars in assembly yards are almost automatically moved onto proper sidings. The fighter pilot engages a hostile aircraft in his radar sights and electronic controls guide his plane and fire his guns for the kill. Vacuum tube and servomechanism provide the deadly intelligence with which the guided missile seeks out and homes on its target. The science of automation is in its infancy—its possibilities limited only by the bounds of scientific imagination.

The impact of these developments upon military thinking has been dramatic. The armed forces of today possess weapons which less than a quarter century ago existed only in the minds of the physicist and the writer of science fiction. Since no nation can claim a monopoly of the scientific mind, it must be presumed that other major nations of the world have achieved or will shortly develop their own successful versions of the same weapons.

It is natural that possession of these new weapons should first affect the fields of military strategy and tactics. The potential destructive power of a thermonuclear device and the speed and accuracy with which it may be delivered have reduced the traditional safety factors of time and space to the point where any effective defensive reaction must be almost instantaneous.

In the concept of warfare which is emerging, the requirement for dispersion of troops enormously complicates the achievement of mobility and concentration of force, two principles which are still prerequisites of success in battle. The problems are many and difficult, but through concept, trial and field test, new doctrines and techniques are emerging. As always, the success of strategy and tactics depends upon adequate logistical support.

The most searching reappraisals have been made in the field of logistics, where military planners have had to face the fact that the nation's economy is not inexhaustible. While World War II was won through prodigal overproduction and time bought by our Allies, we cannot depend upon our production potential or the saving factor of time in any future conflict. The cost of the new weapons and the necessity of keeping them in a constant state of readiness must limit our inventories of conventional weapons and the personnel to man them. In the final analysis, our national security depends upon calculated conservation—which means that we cannot afford to squander what we already possess. Thus, brought into focus, maintenance of equipment assumes an importance coequal with training and operations.

A candid survey of the effectiveness of maintenance in the Army today is disquieting, yet if we are to solve today's logistical problems, we must face the situation squarely. The fact is

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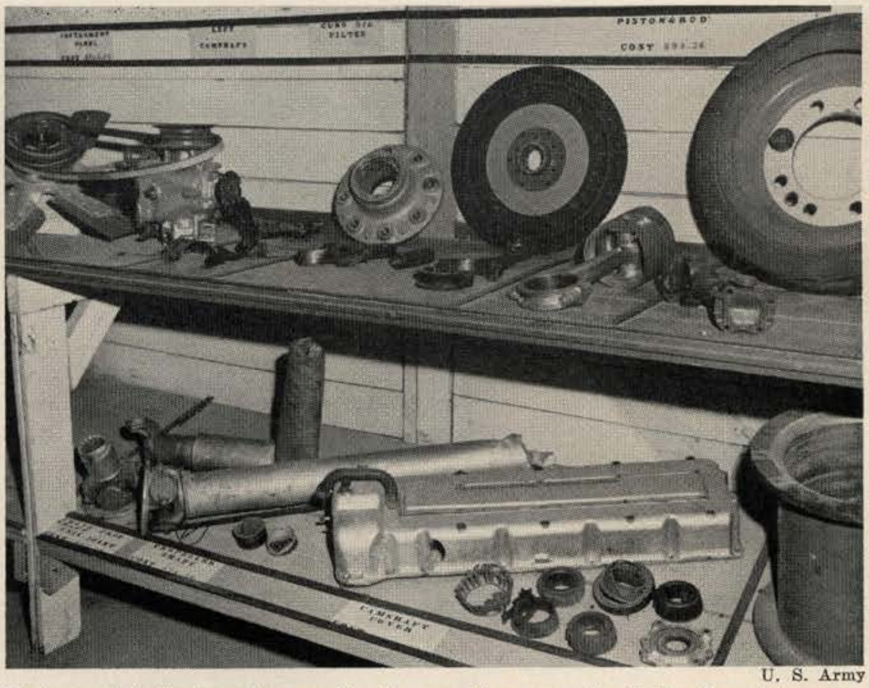
This article was prepared by members of the Army Maintenance Board, Fort Knox, Kentucky, under the supervision of Brigadier General George R. Mather who was the first President of the Board. He is presently assigned in the Office of the Deputy Chief of Staff for Personnel, D/A.

U. S. Army



U. S. Army

Each part indicates the result of user abuse or the lack of maintenance. Every individual must know what is required, how to do it and what not to do.

that maintenance and repair parts supply in the Army today are unsatisfactory. They are unsatisfactory by the standards of World War II, to say nothing of the standards required by the technology of modern warfare. We have demanded more and better equipment of ever increasing complexity, and we have added quantity and quality beyond our present capacity to maintain it. We have failed to realize fully the implications of the professional responsibilities placed on us by our new weapons and techniques. Our position in this respect is most aptly described in the words of Major General Frederic J. Brown, Special Assistant to the Deputy Chief of Staff for Logistics for Parts and Maintenance, in an address delivered at the Command and General Staff College on 3 December 1954, when he said: "Any Cavalryman worthy of the name, who aspired to be an expert in the employment of cavalry or to command cavalry in combat, prided himself on his horsemanship and his skill in the care and conditioning of animals. It didn't take a mass of regulations or a prescribed inspection system to tell him how to condition his command or how to determine its ability to perform its mission, nor was he dependent upon the initiative and judgment of his stable sergeants and his horseshoers. In other words, he was a master of his profession and his technicians. It was not an armchair preoccupation. . . . . We have intensively studied the strategic and tactical exploitation of superior equipment and yet individually or collectively, we have not studied or prepared ourselves for the task of efficiently operating or maintaining these equipments. . . . . We have not completely transposed ourselves into the new military era."

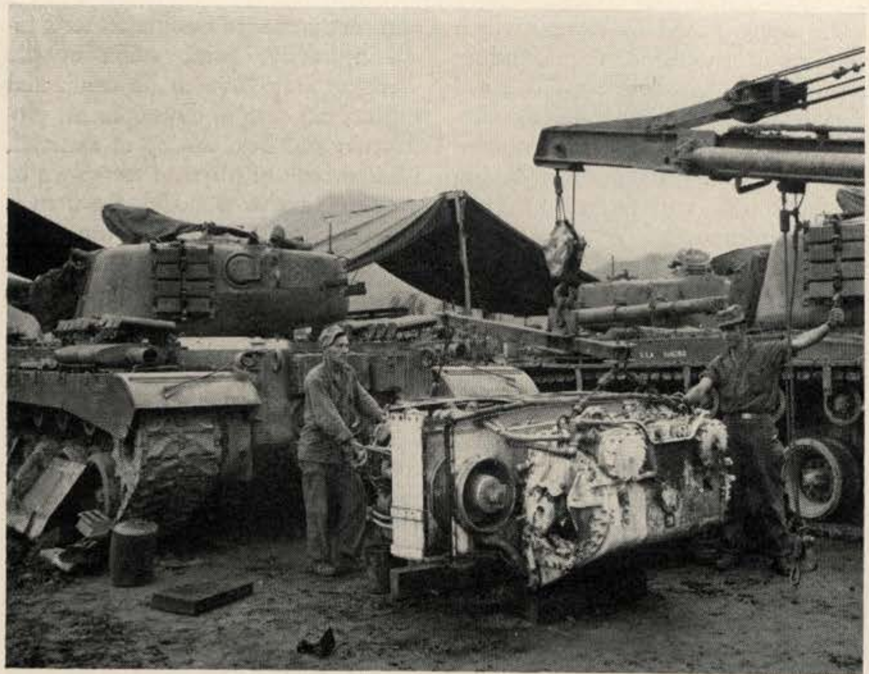
The situation described by General Brown, while it can be partially explained by man's reluctance to come to grips with the unknown, can neither be minimized nor ignored. We face the task of re-engineering a logistical system that is more than ten years, and a war-and-a half, behind strategic and tactical developments.

Self-analysis is painful, but if we admit that some of the causes of our problem lie within ourselves we may logically conclude that we possess the means for achieving a solution.

In the long evolution of the art of war, certain basic principles have remained constant; one of these is the principle that the commander must control the means of supporting his own tactical operations. Supply and maintenance are essential parts of that support. In the United States Army that fact has been recognized in the traditional doctrine that supply and maintenance are the responsibility of command. If that doctrine is valid, as all our past military experiences have affirmed, where have we failed? Our failure has been the failure of command at all echelons to retain mastery of its weapons and technicians. The task is not insurmountable; what the mind of the scientist has devised, other men can master.

In today's Army, command at all levels must recognize that maintenance ranks in importance with training and operations. Training, morale and sound operational plans are worth nothing if weapons and equipment fail in the hour of critical need. There must be a reaffirmation of responsibility and a rededication to the old spirit of the Cavalryman, who looked to the needs of his horse before his own. In a word, we must re-create an atmosphere which will encourage the utmost in the performance of maintenance. Above all, the command approach must be realistic. Preventive maintenance must be taught to all ranks, emphasized and reemphasized until its performance becomes second nature. Organizational maintenance must be systematic, thorough and complete, and must rank on the schedule with operations and training.

Organizational maintenance is the heart and soul of any workable maintenance system; if it is effective, equipment will be operationally serviceable and combat ready. If it is deficient, the Army loses part of its ability to move, to shoot and to communicate. The commander who would have effective maintenance must first assure that definite responsibility for the care of equipment is placed upon all individuals in the chain of command. He must insure that every individual in that chain of command knows how to care for his assigned equipment—that he knows what is required, how to do it and, of equal importance, what *not* to do. The commander must demand and assure himself that he is getting effective preventive maintenance through active and aggressive command supervision during scheduled maintenance periods, and a thorough and orderly system of



U. S. Army

Organizational maintenance is the heart and soul of any workable maintenance system; if effective, equipment will be operationally serviceable for combat.

inspections. To accomplish this requires sound planning and programming. Training and operations must not be emphasized to the detriment of required maintenance. Weapons and equipment, like human beings, require a certain amount of rest and rehabilitation if they are to continue operating at top efficiency.

Command attitude toward maintenance, however, is only a part of the total problem. Even with the best of care, the best of equipment may become unserviceable through wear, battle damage or failure of parts. Effective organizational maintenance must, therefore, be backed up by effective repair organizations in the field and by a responsive, efficient system of repair parts supply. The maintenance system in being, despite many piecemeal efforts to improve it, does not meet these requirements. Inadequate organizational maintenance throws an overload on field maintenance organizations for which they are neither equipped nor manned; supply lines fail to furnish the repair parts which are needed, while bulging at the seams with others which are seldom, if ever, required. One of the basic reasons for this situation is that we have allowed the maintenance effort to be engineered from the producer down rather than from the user up. In our haste to get new and improved equipment into the field we have tended to forget the capabilities and the limitations of the individual soldier under field conditions. A very close coordination between user and supplier is necessary to insure exploitation of the full maintenance capability at the lowest level. This implies that "ease of maintenance" as well as reliability must be a built-in feature of acceptable weapons and field equipment.

The question of providing adequate field maintenance to back up effective user maintenance is one which has required close study in the light of new tactical doctrines. The new tactical concepts place a higher premium on mobility than ever before. Effective field maintenance must closely support the combat units to which assigned; this means that field maintenance units must be capable of moving as the combat units move. Tools and equipment must be highly mobile and capable of being placed in operation immediately. Another and perhaps more important facet of the field maintenance problem lies in the availability of personnel. The complex and technical nature of modern weapons and equipment requires that technically trained personnel be provided for their maintenance. The law of diminishing returns seriously limits our human resources when we consider the requirements of the industry which builds our weapons, our own requirements for technically trained operators, and the overall limitations of the manpower pool. To meet this challenge, radically different doctrines and procedures have been developed by the planning staff of the Continental Army Command. These doctrines and procedures, embodied in new organizational concepts, have been tested in Operation Sagebrush. As a result of these tests, we may expect many changes in the organizational structure and possible realignment of tools and equipment of field maintenance units.

While much can be accomplished through vitalizing organizational and field maintenance, the distribution of repair parts remains a thorny problem. Instead of a modern streamlined system which delivers the required part immediately, we have in the recent past, depended upon supply lines which produced unusable items as frequently as they produced the right ones. This cumbersome, inefficient system developed mainly because we continued to think of repair parts as if they were so many tons of subsistence, ammunition or gasoline. Bulk distribution techniques, embodying the "pipeline" concept, are ideal for items of stable design and few components and large tonnages where normal consumption rates are developed through long supply experience. Repair parts, however, present an entirely different distribution problem. Here we are concerned with a far greater range of line items, with changing design, small tonnage requirements and almost unpredictable rates of consumption. Because of the constant improvement of end items, the development of improved parts to correct design deficiencies and different operating conditions due to climate and age of equipment, the development of realistic consumption tables is extremely difficult, if not impossible.

Although the complete design of a workable system for the distribution of repair parts is a management problem of the first magnitude, and beyond any previous experience of industry or the military, painstaking research and sound planning have isolated the most troublesome problem areas and have pointed the way to their solution.

One essential of an overall solution is to reduce the number of repair parts in the distribution system. The approach to this problem has two objectives: one to eliminate from the system those parts for which no demand is indicated by issue experience; the other to insure that through standardization of end items in new and future procurement the number of new repair parts coming into the system is held to a minimum. Much has already been accomplished by means of these two approaches. Through the techniques of the project "Elimination of Non-essential Repair Parts from Depot Stocks," pioneered by the Ordnance Corps, repair parts stocks are continuously screened and those parts which are nonfunctional in nature are ruthlessly weeded out. The Field Stock Control System reduces the total stockage of repair parts at the forward echelons of supply and assures availability of critical items at the points where they are needed.

The results of the standardization program are gratifying. In November 1953 there were 893,000 repair parts in the Army supply system. By 1 November 1954 this figure had been reduced by 28%, to a total of 638,000 repair part line items stocked in the depot system. This decrease was accomplished despite the fact that during the same period some 120,000 new items were introduced into the system. It is anticipated that figures for the 1954-55 period will show a further overall decrease. This action removes many of the obstructions to a freer flow of repair parts.

Another essential of the overall solution lies in the substitution of service for stockage. To accomplish this requires a simplified requisitioning procedure and expedited delivery all the way from the ZI depot to the using unit. Instead of stocking every conceivable part at every echelon to meet every contingency, smaller numbers of high mortality parts must be stocked at appropriate echelons, and lower frequency requirements must be met by better and quicker delivery. Part of the groundwork in this field is provided in the new field stock control system, tested in Korea, which employs a simplified requisitioning procedure designed to secure demand data at using unit level and to automatically determine items and quantities for depot stockage. The saving in order time will be considerable, since requisitioning units utilize a single line requisition form, preprinted with stock number and nomenclature. These single item requisitions do not require editing or consolidation at intervening echelons and thus can be processed expeditiously to the supplier. Through an electronic transmission system, already developed and under test, it is anticipated that order time can be further reduced to a minimum. However, before we may reap the full benefits of a better stock control system and streamlined requisition procedure, delivery must be further expedited.

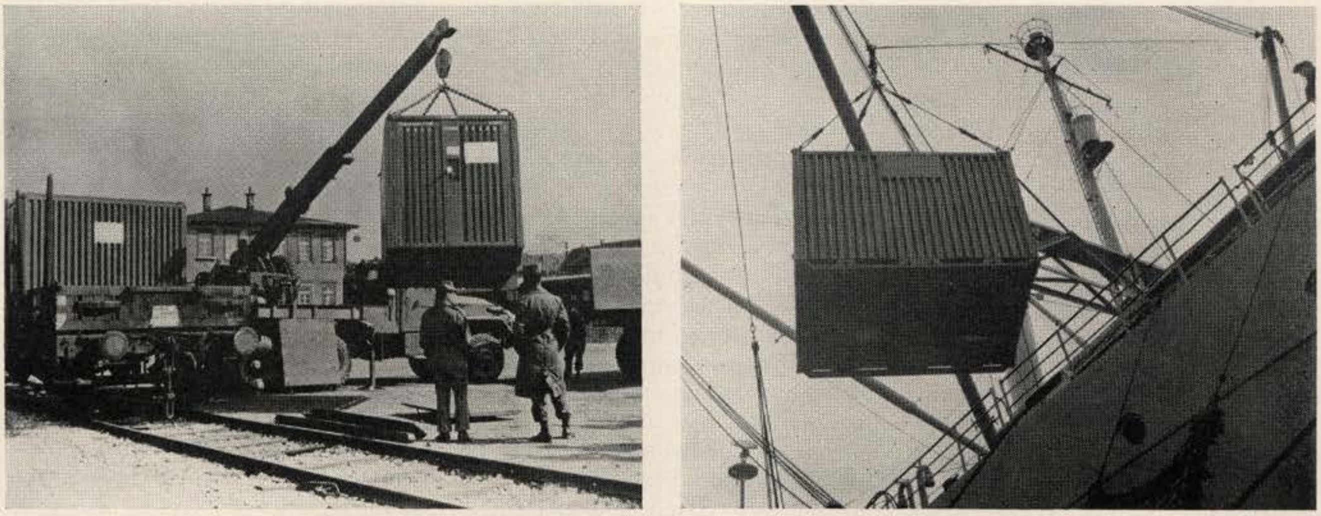
Air shipment has proved to be an incomplete answer since it has had to be utilized within the limitations of the existing distribution system. To reduce overseas shipping time a test of "CONEX" (container express) has been under way for some time. CONEX utilizes a re-usable steel shipping container, loaded and sealed at the depot of origin in the ZI, then shipped by truck or rail to a port where it is deck loaded on vessels for overseas ports, whence it is rapidly delivered to the ultimate user. The CONEX plan was developed in 1952 to alleviate the inadequacy of air freight for the delivery of critical Engineer supplies to the Far East. By this means the Corps of Engineers was able to reduce order and shipping time on critical parts from 120 days to 75 days and to move substantially greater tonnages than could be transported by air. This initial test of CONEX proved so successful that it is now being tested and utilized by all technical services for shipments between the Continental United States, the Far East, Europe and Alaska.

Before the advantages of standardization, realistic stockage, simplified requisitioning and rapid delivery can be fully exploited, certain other problem areas must be resolved.

Continuous maintenance evaluation of equipment must insure the maximum ability to maintain items at organization and field level. To this end, maintenance evaluation tests involving active participation of the using agency have to be conducted during the design, development, production and field testing of matériel. On the basis of physical tear-down of a production pilot model, the item is analyzed for allocation of the maintenance functions to be performed at various echelons, technical manuals or manuscripts are reviewed, recommendations are made for the allocation of special and common tools, and preliminary selection of repair parts is made. The item is further reviewed for any changes which may enhance maintenance at all echelons.

Identification and cataloging of repair parts is another vitally important field. Identification data must be concise and accurate. Because of the multiplicity of repair parts, an error in identification may result in delivery of an unusable part. Stock numbers, nomenclature and other identifying data must be standardized. Part of this requirement is being met in the current Federal Stock Catalog program, which when completed and distribution effected, will provide standard stock numbers and nomenclature for every item of supply. In order that this information may be readily available at every supply echelon the Department of the Army is now revising the entire supply manual system to provide a uniform format for all technical services. Type 7 manuals, covering organizational maintenance, will establish specific repair parts lists for organizational maintenance at each unit level. Type 8 manuals, which are wholesale catalogs designed primarily for technical service use, will list only those parts selected for field maintenance use and stocked in the depot system. Concurrently with this revision, parts now listed are being screened by the technical services to delete those which show little usage or which can be fabricated in the field, or which should be issued as a part of a kit or assembly.

Other programs which should materially improve the supply of repair parts are under way. An improved system of packaging, designed to facilitate fast shipment, sorting, identification and distribution, is being studied. In recognition of the specialized nature of repair parts supply, a program has been established to train "parts specialists" and to authorize



U. S. Army

This is "CONEX" (container express), a re-usable steel shipping container, loaded and sealed at the depot of origin in the ZI, then shipped by truck or rail to a port where it is loaded for overseas ports for final delivery to the user.

their assignment within the TOE's of technical service maintenance and supply units. Logistical and operations and training agencies at DA level have joined forces in a "Reduction of End Items Program" to reduce the number of major items now prescribed in the Tables of Organization and Equipment. This last area calls for a realistic determination of what we need and what we can support in a modern streamlined Army. Accomplishments in this area should prove most remunerative when it is realized that today's Infantry regiment uses 92 kinds of ammunition, including 19 different types of grenades; that there are 81 types of ammunition for tank cannon, 10 calibers of artillery with 66 types of ammunition, 8 types of antiaircraft artillery weapons and 17 different rockets and guided missiles.

The Army has expended a great deal of "blood, sweat and tears" on the problems of maintenance, in the forms of research, critical analysis and planning and programming. However, it soon become apparent that maintenance, Army-wide, had been rather narrowly compartmented within the seven technical services responsible for supply. There was no uniform maintenance policy, no firm doctrine, and there existed no single agency responsible for coordinating these matters. To provide such a coordinating agency, DA established the Army Maintenance Board as a Field Agency of the Deputy Chief of Staff for Logistics, in the early spring of 1955.

Activated at Fort Knox, Kentucky, under the provisions of AR 15-470, the Army Maintenance Board is charged with the mission of "correlating, for the Department of the Army, the relation between the maintenance mission required to be performed by using units and the parts, tools and technical publications required to be supplied to the using units; and the relation between organization maintenance, technical service field maintenance and parts supply policies." Inherent in this mission is the recognition that the ultimate user is a real entity who must have a voice not only in the development of the matériel he is destined to use on the battlefield, but also in the maintenance plan which will support this matériel.

As set forth in AR 15-470, the Army Maintenance Board is directly responsible to the Deputy Chief of Staff for Logistics, and will "develop, review, recommend revision of, and coordinate policies, procedures, and doctrine governing organizational maintenance, and the repair parts and tools for its support, for all equipment of the Army in the field." The Army Maintenance Board is a field agency of DCSLOG, DA concerned with the uniformity and the consistency of maintenance policy, doctrines and procedures Army-wide.

AR 15-470 further spells out the responsibilities of the heads of the technical services in relation to the Board. Chiefs of technical services will retain their traditional responsibility for the design, development, procurement, storage and issue, cataloging and depot maintenance of equipment and parts for which they have been assigned logistic responsibility. They will, as in the past, formulate technical maintenance doctrine and instructions as prescribed in AR 750-5 (now under revision). Under the provisions of AR 15-470, however, they will also be responsible for coordinating technical maintenance doctrine and instructions pertaining to organizational maintenance with the Army Maintenance Board; and will coordinate with the Army Maintenance Board on matters pertaining to field maintenance of equipment to insure compatibility with organizational maintenance operations and parts and tools allocations. Chiefs of Technical Services are further directed to make available to the Army Maintenance Board the services of and the information developed by their maintenance and supply points, centers, schools, boards and research and development activities to enable the board to perform its mission without duplication of effort.

Representing the ultimate user of military supplies and equipment, the Continental Army Command is required by AR 15-470 to keep the Army Maintenance Board advised of the latest tactical and logistical doctrine developed by that command pertaining to the Army in the field, and to make available to the board the information developed by its boards, schools and test agencies. In the field of maintenance CONARC reviews, develops and recommends to the Department of the Army new and revised doctrine, techniques and organizations for the Army in the field. It may be seen that coordination of maintenance matters with the Army Maintenance Board is of vital importance, since doctrines, tactics and techniques developed by CONARC will affect the activities of the Army throughout the rest of the world.

Commanders at all echelons retain responsibility for the organizational maintenance of equipment under their control. Likewise, overseas commanders retain the responsibility for depot maintenance in their commands.

From a study of AR 15-470, which sets up the Army Maintenance Board, together with a proposed revision of AR 750-5 (Maintenance of Supplies and Equipment) and a proposed new AR on Command Maintenance Inspections, it becomes apparent that renewed emphasis is being placed upon command responsibility for maintenance at all echelons of command.

Organizationally, the Army Maintenance Board consists of an Administrative Section and four branches: Policies and Doctrine Branch, Maintenance Engineering Branch, Parts and Tools Allocations Branch and Liaison, Training and Special Projects Branch.

The vital concern of the Army Maintenance Board with the ultimate-user aspect of maintenance is clear in a review of the functions of its branches.

The Maintenance Engineering Branch assists in the development of and reviews tables of organization and equipment for adequacy of maintenance personnel and their skills. It supervises and coordinates determination of the nature and scope of organizational maintenance. It reviews and insures coordination of maintenance allocation charts which determine the levels at which maintenance operations will be performed. It reviews technical publications governing maintenance, operation and modification of equipment. It maintains liaison with the Continental Army Command and with the technical services on "ease of maintenance" to insure that new equipment is engineered to fit the capabilities of troops in the field.

The Parts and Tools Allocation Branch reviews the requirements for and the provisioning of special tools for organizational maintenance operations. It reviews Supply Manuals to insure that parts authorized for stockage are consonant with authorized maintenance operations. It reviews Department of Army policies governing repair parts for organizational maintenance and recommends changes or revisions to the Deputy Chief of Staff for Logistics.

The functions of the Liaison, Training and Special Projects Branch are: to review the adequacy of individual MOS and unit training as that training affects organizational maintenance; to advise Continental Army Command on the maintenance training of officers and specialists in the Army school system; and to review maintenance inspection requirements and recommend changes to the Deputy Chief of Staff for Logistics.

The Policies and Doctrine Branch is the coordinating office for the Army Maintenance Board. It reviews Department of the Army policy and doctrine governing organizational and preventive maintenance operations; and reviews, from the user's standpoint, the type and format of maintenance publications, including supply and technical manuals.

The board is authorized 41 action officers, of whom 33 will be commissioned officers of the Army and eight will be civilian technical personnel. Officer and civilian personnel filling these action positions have been carefully selected with emphasis on maintenance and supply experience within their branches. Distribution of action personnel has been so effected that each technical service and interested arm has received equitable representation on the board.

Information developed by other existing agencies, including those of the technical services and Continental Army Command, will be utilized by the Army Maintenance Board to the greatest extent practicable. Information developed by boards, service schools, research and development facilities and testing agencies bearing upon maintenance problem areas is of prime interest to the board.

Although many of the aforementioned projects for the improvement of maintenance were initiated before the inception of the Army Maintenance Board, and although many of them *have ramifications which extend beyond the immediate purview of the basic AR 15-470, the board has a vital interest in all factors which affect the accomplishment of organizational maintenance. The board, for example, is actively engaged in a project to systematize maintenance planning for new major items procured by the technical services for the Army in the field. The primary purpose of this project is to gather together, in one package, concurrent with the development of the new equipment, technical publications which will: define maintenance responsibilities in each of the five echelons; specify the allocation of tools and test equipment; insure that technical manuals and supply catalogs are available for issue with the new equipment; detail the allocation of and program the procurement of repair parts.

The Army Maintenance Board is currently monitoring the preparations for the test of Project MASS (Modern Army Supply System) which is to be conducted by 7th Army in USAREUR, beginning 1 July 1956. Of special interest will be the test of the latest concepts of repair parts supply and its effects upon organizational and field maintenance.

In the field of guided missiles, the Army Maintenance Board has already achieved closer coordination between the user and supplier, and is actively assisting in resolution of the problems of maintenance allocation, parts support and technical instruction. Because of the "crash" nature of the guided missile program, this is, and will continue to be, a critical problem area.

If we are to make the most of our modern weapons, maintenance must keep pace with technical development. The longer the delay, the wider the gap becomes, and the problems of supply and maintenance more and more complex. The achievement of a responsive, dependable maintenance system demands the utmost in coordination and a sense of urgency on the part of all concerned.

John T. Colson
Alabama Poly.
Institute

Robert H. Allison
Massachusetts
University

Jack F. Calvert
New Mexico
Institute

Kyle Cutler Sessions
The Ohio State
University

William W. Mears
Virginia Military
Institute

OUTSTANDING SENIOR 1956 ROTC CADETS

ARMOR

For the past four years the United States Armor Association has given awards to the outstanding senior cadet in the Armor Reserve Officers Training Corps at those colleges or universities where an Armor instructional course is still in operation.

Since last year two more institutions have transferred from the Armor Course to the General Military Science Course. With the further increase in Armor, both in the Reserve and Regular components, it would appear on the surface that more institutions should be giving Armor instruction rather than less. With six National Guard Divisions scattered around the country it would seem that the commanders of these units would be most desirous of obtaining ROTC graduates in Armor. Also it is believed that the ROTC graduate with basic schooling in the mobile arm is more valuable to the Regular Army Armored commander upon assignment to a unit. With four active Divisions and many Armored Cavalry Regiments and separate Tank Battalions there is a need for more company grade armored officers.

The engraved scrolls signed by the President and the Secretary of the United States Armor Association and a one-year's honorary membership have been forwarded to the ROTC instructors at the various institutions for presentation to the individual recipients. A package of books has also been sent to be awarded to those outstanding graduates. The package includes: Robinett's *Preparation For Leadership in America, Tank Company Commander's Guide* by Moore and Brier, Guderian's *Panzer Leader,* and either Patton's *War As I Knew It* or Semmes' *Portrait of Patton.*

As in past years these Distinguished Military Graduates have been tendered appointments as Second Lieutenants in the Regular Army upon graduation this coming June. Whether they accept the appointment in the Regular Army or choose a civilian occupation with a Reserve Commission we wish them well and welcome them to the team of combined arms.

To the instructors, both commissioned and noncommissioned, at these various institutions we give an accolade and a vote of thanks for a job well done. For it is here at College level where you, as representatives of the Army can accomplish a great deal in the field of civilian-Army relations.

We hope that these awards will enhance your position and assist you in the accomplishment of your mission.

To the recipients of this year's awards we salute you!

George H. Charles, Jr.
Clemson College

Gerald E. Miller
University of Illinois

David F. Aldrich
Norwich University

Donald L. Burton
Texas A&M College

All Photos U. S. Army

Curious as to what sort of engine powers the American M47, four men of the 44-man German tank platoon dig inside to see for themselves.

Close inspection of the delivered American M47 tank is made by Hauptman (Captain) Fritz Sacha, commander of the German tank platoon.

These tanks are the first
armor equipment
of the new West German Army

The command "Absitzen" rings out and a spirited German tank crew jumps from positions on the tank to the ground.

RETICLE
PATTERN
2500
3000
4000
56 54 52 50 48
GTAG

In a classroom at the Andernach camp a German sergeant and GTAG instructor discuss the operation of a late model T41 range finder.

GERMAN TRAINING ASSISTANCE GROUP

The German soldiers at the Andernach camp are a select group of volunteers who will become the new German Army's officer and NCO cadre.

The German Training Assistance Group is the first representative of a foreign power to ever help train the German Army. It has always been the other way around. General von Steuben, you'll remember, brought a detachment of Hessian soldiers to America to help train Washington's Army during the Revolutionary War.

Well, maybe we're helping to pay that back.

A GTAG instructor demonstrates for a German tank platoon leader how to load the 90mm cannon breech of the M47.

A GTAG rocket launcher expert adjusts the eyepiece on a 3.5 inch rocket launcher for a young German recruit.

A GTAG instructor watching to see if the German soldiers have absorbed instruction on assembly of a machine gun.

Many commanders have attested to the success of Packet Platoons. Here is one Battalion Commander's reflections after a year's training.

ARMORED PACKET PLATOONS

By LIEUTENANT COLONEL WALTER J. DAVIES

GENERAL Maxwell D. Taylor in an address on leadership at the United States Military Academy stressed that one of the qualities of leadership is the gift of human understanding, the ability to treat men with understanding as individuals and not as Army Service Numbers. He also pointed out the fact that the American selectee will rapidly adjust to the Army way of life if shown the *why* of things he is to do, and is impressed with the fact that his officers are interested in his welfare.

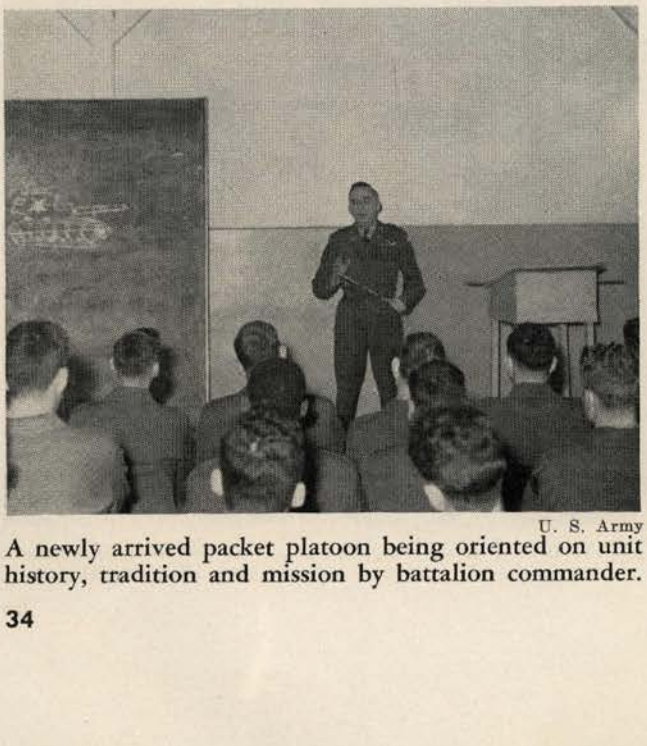
LIEUTENANT COLONEL WALTER J. DAVIES, Armor, is a graduate of Michigan State University. He has served two tours of duty in the Far East. After a Stateside tour he was assigned as Battalion Executive Officer and subsequently to his present position as Battalion Commander of the 826th Tank Battalion in Europe.

The Packet Platoon system of training and assigning replacements has been a great boost in this area, providing commanders properly carry out the system; that is, "keep the platoon together when assigning it in the receiving organization."

In the Spring of 1954 the 826th Tank Battalion received its first packet platoon, and since that time the majority of the tank crewmen replacements have been from this source.

In December, 1954 the twelfth packet platoon arrived, making this battalion the first all packet platoon tank battalion in Seventh Army. Since that time eleven additional platoons have arrived as replacements for those whose strength has been reduced due to rotation. Now after over a year of training with a 100% packet platoon battalion, during which it has undergone the rigid Seventh Army training requirements including the annual tank gunnery firing at Northern Army Group Ranges, Platoon, Company and Battalion tests, Corps Maintenance and Inspector General Inspections, in which this battalion has rated among the top, it is a matter of record that this system is an ideal method of providing replacement personnel to combat type units.

In analyzing this replacement system, it is well to look at the sequence of events in the transition of a civilian youth into a combat ready soldier. This young selectee leaves his home, family and friends and finds himself in a replacement training center among total strangers in strange surroundings. This is the stage where he begins the transformation from a civilian into a soldier. He is assigned



U. S. Army

A newly arrived packet platoon being oriented on unit history, tradition and mission by battalion commander.

U. S. Army

At their new assignment a "glad to see ya" spirit is prevalent as the new platoon is introduced to the old crews.

to a group of trainees and begins to make new friends and gains respect for his officers in addition to becoming adjusted to a new way of life. Soon he realizes that his basic training will end, and that he will again be uprooted and transferred to some unknown unit stationed at some military post which can be anywhere in the world. At this point the packet platoon system takes effect. If this young soldier is fortunate and is a member of a packet platoon he knows where he is going, when he will leave, that he will be with other soldiers whom he knows, and that his platoon leader, who is the officer he has learned to respect and to look to for leadership, will be going with him.

Necessary orders are published at the Replacement Training Center assigning the entire platoon directly to its future organization. Many times the platoon is air lifted to the POE. At the POE and aboard ship it remains intact as a platoon and upon arrival at the Port of Debarkation it leaves the ship and goes directly to the assigned organization, bypassing the overseas replacement system, which is an indirect asset to the troop units since talent is not weeded out for assignment to headquarters, etc.

The receiving organization is informed well in advance of the composition of the new packet platoon and as to when it will arrive. This is a critical point for the gaining commander as he can take advantage of the advanced notification to see that advanced preparations are made for the new arrivals such as securing name tags and unit insignia, making out passes, bunk tags, etc.

When the new platoon arrives it should be met by the Battalion Commander, Company Commander and its Noncommissioned Officers, who welcome and orient the personnel on the unit's history, tradition and mission. This, coupled with the advanced preparation, gives the new replacements a definite feeling of being accepted, and they have little trouble in assuming their place in the organization.

In reflecting back over a year's training with an all packet platoon tank battalion, certain features stand out:

1. Seventy-five per cent of the original members are still assigned with the platoon they trained with in the States. The remainder have attended specialist schools and are now cooks, mechanics, clerks, etc.

2. The platoon leaders have remained in command of their original platoons for an average of 8 months.

3. Areas of aptitude and educational levels of the packet platoon personnel compare favorably with normal pipeline replacements.

4. The packet platoon personnel who have attended service school within the theatre have attained excellent records.

5. The unit training program progresses rapidly and smoothly mainly because all members of a platoon have a similiar background and they know each other's strength and weaknesses. They also arrive with a platoon *esprit* which began in basic training. This only needs to be furthered and welded into company and battalion *esprit*.

6. The outstanding achievements of this battalion, which include the highest scoring tank battalion in tank gunnery within Seventh Army for the past two years, first place among the tank battalions in the 4th Armor Group on the 1955 battalion tests and a Superior rating on the V Corps annual Inspector General's inspection for FY56, are largely due to the proper use of packet platoon replacements.

7. Disciplinary cases among packet platoon personnel are lower than among regular pipeline replacements. Again the platoon pride and comradeship which began in basic training is the contributing factor.

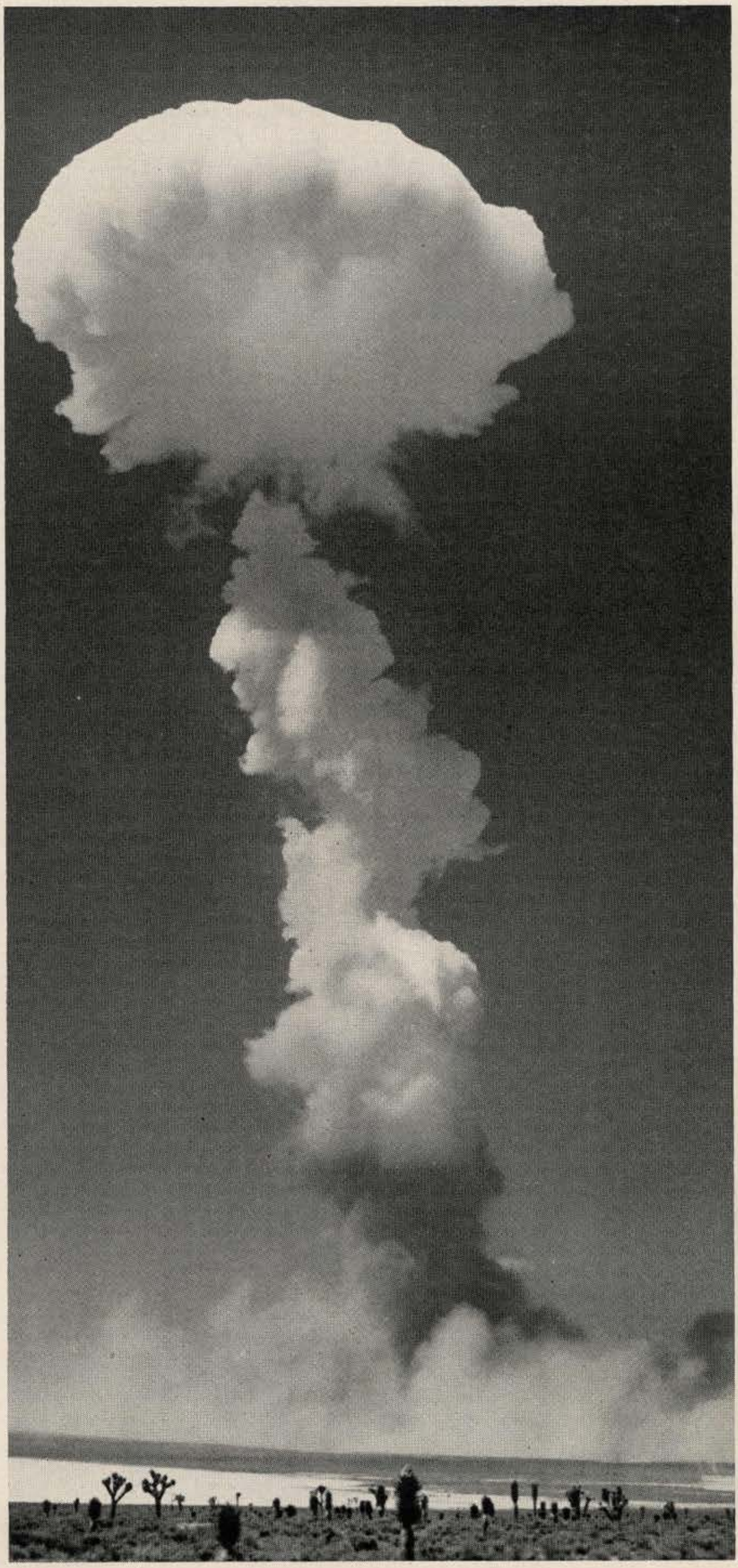
The packet platoon system of replacements is a well conceived, proven plan but like any program, its ultimate success or failure depends upon the intelligent application and proper implementation by the commander of the gaining organization. He is given the nucleus and he must utilize it and develop it to its potential, rather than tear it apart by treating a packet platoon as a group of individual replacements.

U. S. Army

Introductions having been completed the crews take deserved pride in showing the packet platoon their vehicles.

U. S. Army

Having taken its place on the team the packet platoon undergoes its first inspection by battalion commander.



U. S. Army

ATOMIC MEDICAL CARE

FROM observation of three major post-1945 maneuvers and from studying many disaster control plans, I have become convinced that many of our combat units are nearly ten years behind the times in their thinking about what they will *do* or what will be done *for* them after an atomic strike. They are still thinking about what to do after *a* strike or *the* strike instead of what to do in the midst of several strikes, one after another in the same area, or all at once in several areas across the front.

We still seem to be working on the same basis we used after the explosion at Texas City. In that case, help came from many miles around. I was on leave at the time of the explosion. I proceeded to Galveston and wired my commanding officer that I was placing myself on temporary duty. When the flap died down we all signed out from Fort Crockett and returned to our home stations. In battle we cannot drop what we are doing and take off for ground zero. And of course, no enemy landing followed the violent explosion at Texas City and hampered the cleanup there.

In the military we tend to be thinking along the same lines as the average civilian community. We admit that the likelihood of our being hit by a nuclear weapon is far greater, but in *what to do* about it, we still seem to be thinking in terms of a single dramatic Act of God follow-

By LIEUTENANT COLONEL DOUGLAS LINDSEY

When an atomic weapon hits your battalion, round up the men who can still function. Take tactical action. Sympathize with your medics. It is time for worry and for action but it is

NO TIME FOR DESPAIR

ing which all business will come to a standstill while we "control the damage!" When I say "we," I mean a good many of us are. At least many of the logistics people are. The line people seem to be thinking on a reasonably realistic basis in the provision of alternate command posts to assure tactical control, but there still needs to be something worked out on the procedures for the collection, control and utilization of stragglers or survivors.

The concept of "area damage control" is quite appropriate to the communications zone and possibly to the army support area. There we can organize provisional emergency teams in all the service organizations. When the occasion demands, they can close down their own shop, at least partly; proceed to the scene of disaster; and assist in cleaning up the mess. But I hardly feel that the same general procedure is applicable to combat divisions. Nuclear devices are *fighting* weapons. The enemy uses them to help his *fight*. Adjacent and supporting units are needed to *fight*, not clean up. Yet divisions are copying the rear area damage control plans almost verbatim—working out elaborate arrangements for reconnaissance and survey of the strike area, and for establishment of control agencies to determine the need for, and coordinate the actions of, the elements required to effect maximum salvage. I cannot seem to agree that the term "area damage control" is properly descriptive of measures such as committing the division reserve to strengthen a threatened sector, the execution of one of several counterattack plans, or the relief of a worn-out unit. These are straightforward *tactics* which must follow whenever a combat battalion of a division on line is hit by an atomic weapon of the enemy. Either this is not "damage control," or the U. S. Army has been in the "damage control" business since 1776.

Almost as bad as the preoccupation with the business of stopping to clean up the gore, instead of rolling with the punch and continuing with the battle, is the idea that the *medical* problem following an atomic strike is simply insurmountable. This is almost assuming the character of an official doctrine, but it is sheer poppycock! The medical job is difficult but not impossible. It is not an excuse for completely disrupting the operations and procedures of the tactical units involved, nor for wholesale overhauling of the medical evacuation system.

Perhaps we should review what actually happens when an atomic weapon is exploded. But first it may be wise for me to introduce myself. I am a physician, not a physicist. I make no claim to know the inner workings of an A-bomb. However, I do hold a valid license in the 3d, 4th and 5th echelons of repair and reconstruction of the rifleman and tanker, both the old model and the new "ATFA" modification. If the physicists and engineers give me certain basic data (and they have) I can talk with some logic and background on what happens to the *people* involved.

So then, what happens? There is a *flash* of light, a wave of searing *heat*, and a big *bang*. *Voila!* We are all dead! No? No! How mysteriously powerful this thing is! The heat—she comes at the speed of light! The blast—she descends at sonic speeds!

This is strange, is it not? The heat *is* light. And the big bang and the blast *is* a sound wave. Since the heat is a flash of *light* it travels in straight lines. It can only burn you if it can "see" you. Unless it catches your clothes, or your house, or your vehicle on fire, it can only burn you over 50% of your body at most. Even this 50% is difficult. Not even standing stark naked at a *position of attention* will rate you a 50% effective burn! Even if you were naked, just a little bit of modesty (à la "September Morn") would enable you to cut the burn down to around 35 to 40%.

LIEUTENANT COLONEL DOUGLAS LINDSEY, M.D., is a qualified surgeon. During World War II he was a battalion surgeon with the 29th Infantry Division in Europe. He also commanded the 30th Medical Group in Korea. During these two wars he has earned two Purple Hearts and two Silver Stars.

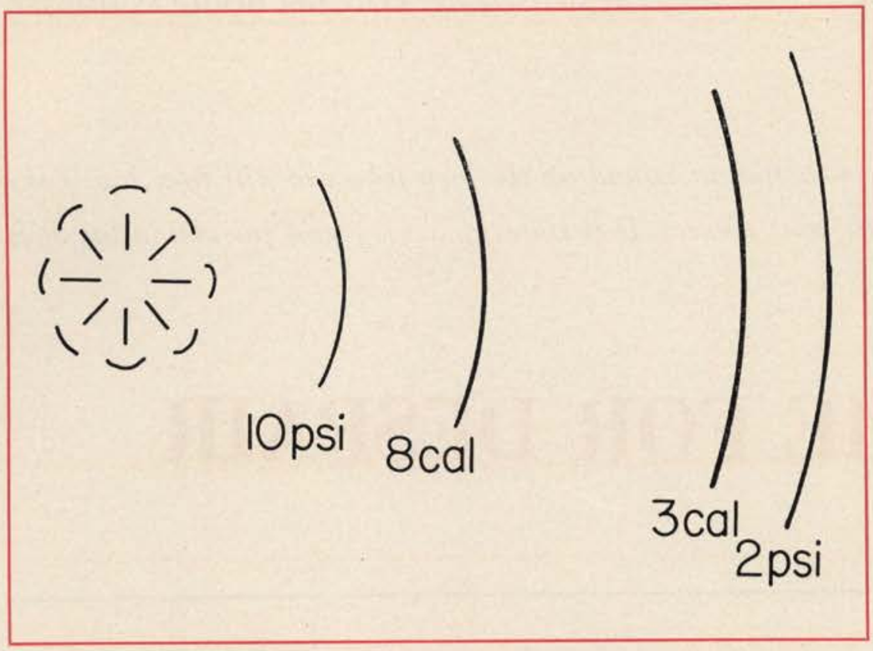


Figure 1

The blast comes at the speed of sound about 1100 feet per second. Close in to the fireball the blast wave actually travels much faster than this figure, but still it takes nearly four seconds for the blast wave to cross two grid squares on the map. No one wants to be only 2000 meters from a nuclear explosion of any size, but if it happens that you are, you have four full seconds (count them, please on a sweep-second watch, "One Thousand . . . Two Thousand . . . Three Thousand . . . Four Thousand") in which to dive for a hole, or in which to close the hatch.

Let's look at some of the phenomena quantitatively. *Figure 1* shows a schematic explosion surrounded by four concentric rings. Note the ring marked "8 calories." At this distance from the explosion an exposed surface receives a thermal energy input of 8 calories per square centimeter. Note there is no yardage or mileage scale on this figure since the actual distance is immaterial, and the relativity of these figures will not be changed greatly whether the weapon is of 2-KT or 200-KT yield. *Twice* as far out as the 8 calorie line the heat will *not* amount to 4 calories per square centimeter, but only 2 calories per square centimeter. The *surface* over which this heat must fall has not been expanded in *two* dimensions. Actually we are not much interested in the 2 calorie line, but I have marked a 3 calorie line on the figure. Now this and the 3 calorie line are important landmarks. If your skin surface receives less than 3 calories per square centimeter you will most likely sustain only a good honest sunburn. Over 3 calories, but under 8 calories, you will get a second degree burn—blisters. At 8 calories and above the burn is *third degree,* that is, the exposed skin will be plainly cooked. There is a great difference in the amount of treatment that burns of varying degree require.

The other two lines on the figure represent overpressures in pounds per square inch. At, and just within, the 10 pound line, unarmored vehicles will be mashed down, turned over, and stripped of fenders, windshields, and hood covers. The 2 pound line is about as far out as significant damage will occur from blast pressures. Windows will be broken and shingles and loose boards torn off.

Just how much is 10 pounds per square inch? Armored officers are well aware of pounds per square inch in terms of ground pressure of armored vehicles. The ground pressure of the M48 tank is about 14 psi. The ground pressure of the M59 APC is about 7 psi. In other words, 10 psi is a little worse than getting run over by an M59 and not quite so bad as getting run over by an M48!? Certainly no one wants to be run over by a tracked vehicle. But *is* it this bad? No, these situations are different.

Your body right now bears about fifteen pounds per square inch of atmospheric pressure. But, of course, what we are concerned with here is *over*pressure above that of atmospheric pressure. The point is that the body withstands readily the smooth, even, pressure of air or any other fluid medium. The body yields to this pressure, but a brick wall or a plate glass window or a jeep fender does not. Your body will withstand overpressures of 60 psi or more without damage to anything other than the eardrums. It probably takes something on the order of 200 psi to cause significant internal damage.

Blast is not going to hurt you after an atomic explosion, that is not directly. The blast hurts you *in*directly by turning your vehicle over on you, by submitting you to a hail of flying bricks and gas cans, or perhaps, by hurling you up against a jagged tree stump with some considerable force. The cuts and punctures and fractures which are the secondary results of atomic blast are not so serious as those resulting from small arms and shell fragments—they are due to *low* velocity missiles. As tankers you are certainly as familiar as doctors with the vast *in*ternal destruction that follows a small *high*-velocity penetration. This extensive internal destruction is *not* a characteristic of the wounds caused by an atomic explosion.

You will note that I have said nothing about *radiation.* This is a deliberate omission.

Radiation casualties are not important in numbers. We do get radiation effects from an atomic bomb but due to certain physical considerations these effects do not generally extend out further than 1500 yards. There is no great difference between the severe radiation damage range of a low air burst, whether or not it is 15-KT or 100-KT. Troops within 1500 yards of ground zero are far more likely to be cremated, stomped to death, or decapitated and dismembered.

Radiation casualties are not pressing in point of time. Even if we should have a man near ground zero who has been shielded against burns and who has escaped physical injury from blast and flying debris, with the net result that the sole effect of his body is 700 roentgens of radiation, he will *not* be immediately incapaci-

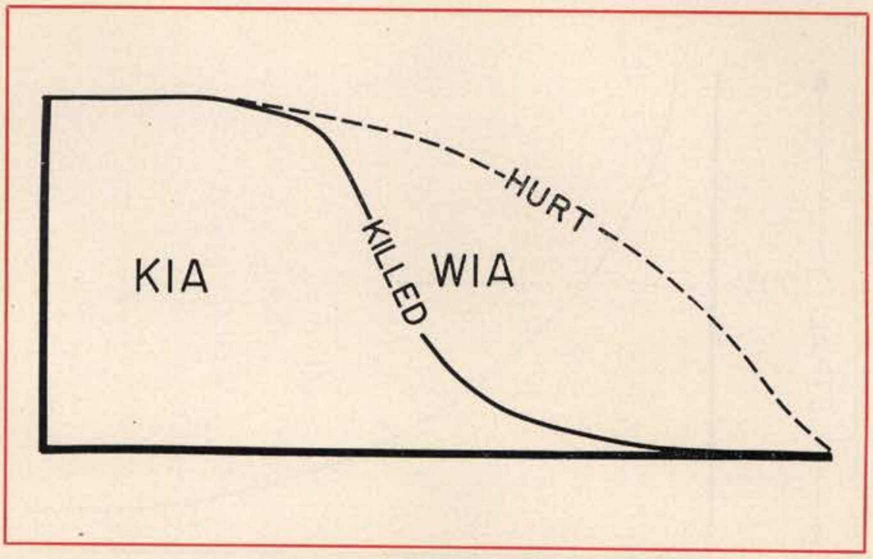


Figure 2

tated, though he will die later. On the first day, or even in the first week, we do not need to devote any significant attention to radiation casualties.

And, unfortunately, even though we might be able to identify such casualties on the first day there is little we can do for them. Even if we know that a man has received a dose of 450 roentgens and consequently may stand only a 50-50 chance of survival, he is not a candidate for immediate vigorous treatment. His fate is in the hands of his own constitution and the will of God. Our treatment is not anticipatory but only symptomatic. As he develops nausea and vomiting we will hospitalize him and feed him by vein. As he develops a low white blood count and sustains infections, we will give him antibiotics like penicillin. As he develops a low red blood count, we will give him transfusions. All of this can be done some days after the explosion, and in some hospital in the rear.

Actually a great deal of concern over the bugaboo of radiation is due to a great fear of sterility. It takes around 400 to 600 roentgens of radiation to the entire human body to cause death. It takes around 4000 to 6000 roentgens of local radiation to the testicles to insure permanent sterility!

What people fear, of course, is not sterility but impotence. There is a distinct difference. They are not necessarily concurrent.

This little exposition of basic thermal, mechanical and radiation physics applied to the human body has some deep practical implications.

What can we do for protection against *burns* from an atomic detonation? First, be as far away from the site of the detonation as possible! This accounts in part for the change in our tactics which provides for a distance of 2,000 to 4,000 yards between adjacent battalions. Second, arrange to be hit on a day when there are low clouds or a good ground fog! Or, lacking that, always arrange your bivouac and assembly areas so as to be in woods or thickets. I am, of course, being facetious. But it is of value to know that these factors do offer significant protection. Soldiers cannot go off to do battle under a canopy like a maharaja hunting elephants, but they can carry other types of cover with them. We can make it routine (at least in a well disciplined unit) for troops to have their sleeves down, collars turned up, and helmets and gloves on. The part of the skin surface that the bomb can "see" is then going to be only 2-4% of the body surface.

The best protection against *blast* is to arrange to be buttoned up in a tank, or occupying a sandbag bunker which is stressed to withstand a sudden blow of 15 psi! This, of course, is not going to be feasible at all times, but tankers will always have two to three or more seconds to disappear inside the hull. And even on the move, infantrymen will have the same two to three seconds to dive prone and lie flat against the ground. When the infantryman stops he always has a valid requisition for a pillbox, of sorts, in the form of his shovel. If he digs his foxhole deep, and makes it narrow, or covers the top, he can easily withstand an atomic blow which will destroy completely the buildings and vehicles on the surface of the area around him.

The probability of being *hurt* in some degree by an atomic explosion falls off, of course, as the distance from the explosion increases. This is shown by the top curve in *Figure* 2.

The probability that this damage which is inflicted on you by the atomic blast will *kill* you is not so smooth a line as shown on the lower curve in *Figure* 2. The sharp downward break in the curve occurs at about the distance at which the thermal energy received is 8 to 10 calories per

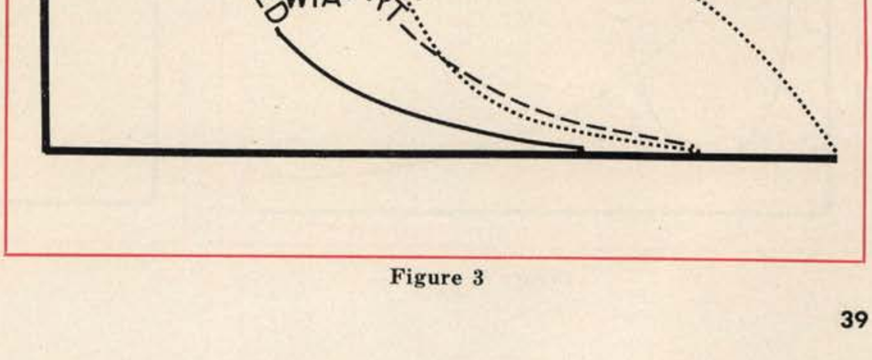


Figure 3

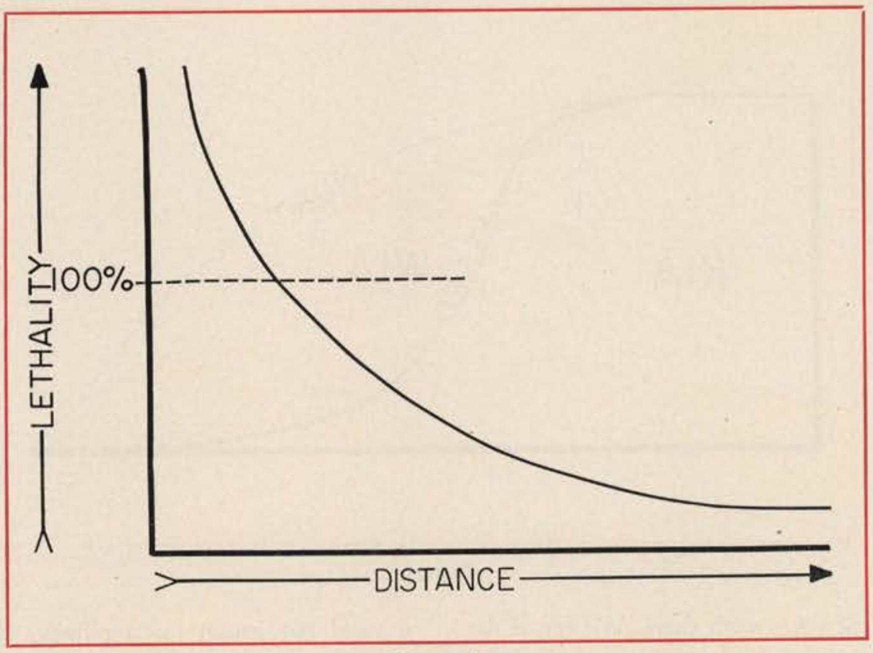


Figure 4

square centimeter. A burn from this dosage of heat is a deadly proposition. At about this same point too, we get into high overpressures which collapse buildings and overturn vehicles and inflict serious and often fatal damage on personnel. A few fatalities will occur even way out toward the end of the distance scale, due to freak accidents, such as a 2 psi blast blowing in a glass window on a rear area clerk and cutting his throat as he sits quietly at his desk.

Sensible precautions by trained and disciplined troops will cut both of these curves way down, as graphically illustrated in *Figure* 3. Savings in combat personnel are considerable. The number of killed has been cut down markedly but the *area* between the killed and the hurt curves is still fairly great. The job of the medics has not been radically changed although the result to the combat commander is vastly different!

It is sometimes difficult to get the point across that the individual soldier himself can do a great deal in the way of protection against a major atomic blast. The popular press has colored much of our thinking by talking about casualty figures that are entirely applicable if our military personnel are going to be stripped and lie out flat in the desert. At a certain point on the distance line from the blast such a staked out soldier would be killed instantly, or will die shortly after the blast in spite of the best medical care. Yet if we place in this same location a trained soldier of the United States Army with his normal field equipment and say to him "Now, son, in a few minutes over in that direction there is going to be one h - - - of a big bang. If I were you I would do something about it," he will *do* something about it and he can stay in this same location that has been fatal to a staked out laboratory specimen. He can survive the blast with nothing more than a little dust in his eyes and a ringing in his ears.

What does all this add up to in terms of numbers of personnel involved? The details are not essential here, but we can take a situation which I can arbitrarily state may be considered fairly typical.

After a fairly accurate, but not perfect, target analysis, the enemy may lay in a close hit on a battalion area containing 1000 men. If it is close enough the unit may sustain 100% casualties; about 500 dead and 500 wounded. If, however, his delivery means or his target analysis leads to a considerable error, and he gets a near miss, the unit may wind up with only 50% casualties: 100 dead, 400 wounded and 500 completely unhurt.

Note the remarkable change in the *ratio* of the dead to the wounded in these two situations. Under conditions of a close hit the ratio of dead to wounded is 1 to 1. But under the conditions of a near miss, the ratio of the dead to the wounded is about 1 to 4. Why? *Figure 4* presents a stylized curve of lethality of the weapon. If our battalion (*Figure* 5) is placed with most of its elements fairly close to the burst, many of the personnel of the battalion will actual-

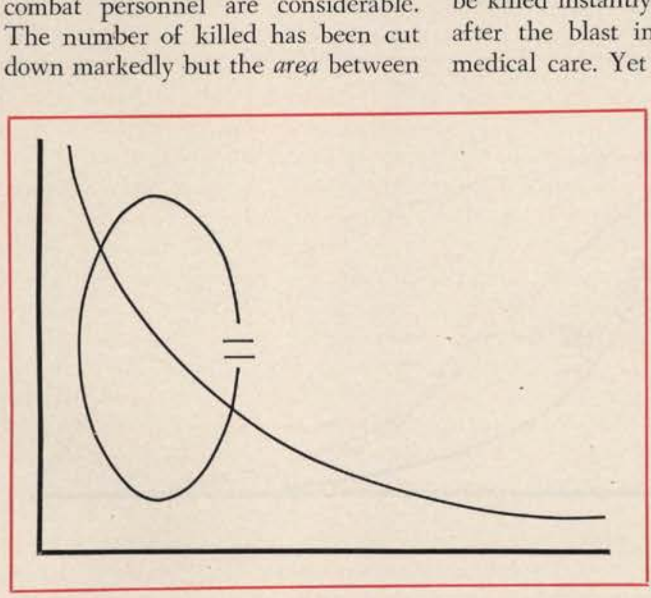


Figure 5

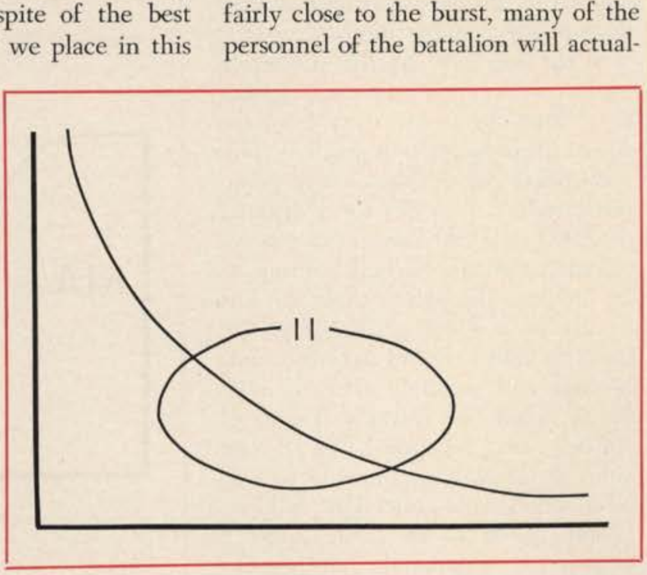


Figure 6

ly sustain damage *far beyond* that necessary to kill them. Many of them will be "killed" three or five or even ten times all at once. Out a little further from the blast, personnel will suffer damage sufficient to kill an "average" man, but since all personnel are not average, a tired, worn out old soldier, or a scared, shy new one may lie down and die after somewhat less than an "average" fatal beating. Conversely, a tough tanker may take more than the average and still live.

If, however, our battalion, or most of its personnel, are somewhat further away from the center of the blast as shown in *Figure 6,* then a lesser number of the battalion will be killed and more of those killed will be killed only once or twice or three times at the most. There will be fewer people on the border line of life and death, and a far larger group are subjected to personal damage which is not of such magnitude as to kill them. This accounts for the great disproportion in the ratios of dead and wounded in two situations.

If we move the battalion closer to the center of the blast we may find 700 dead, and only 300 wounded. If the battalion is further away, there are fewer casualties of all types.

There is a point at which maximum wounding effect occurs. Under typical circumstances, when the target is a group of trained troops in the field, the maximum number of wounded will be about 50% of the strength of the command.

If the battalion is hit dead center with a weapon of considerable KT yield, the G3 can wipe the unit off the situation map and then take some steps to plug the hole in the line with some other organization. In such instance the cleaning up of the aftermath is a relatively minor problem for the Army Medical Service! As the damaged unit tends to be located more toward the fringes of the blast effects, it becomes both less of a G3 problem and less of a medical problem. A casualty total of 150 wounded in a battalion in one day is a hard loss to suffer, but it is not a completely unusual circumstance even in conventional warfare.

The blast that will give us (I refer here to the G3 and the medics.) our biggest headache is a close hit, or a near miss in which approximately 50% of the command is wounded.

U. S. Army

Helicopters speed up evacuation but it requires 75-100 H19's to move 400 men.

So the battalion surgeon never needs to worry about how he will take care of 1000 casualties. All he has to worry about is 400 or 500 wounded!?! Easy, yes? No! It is a big job, but it is not impossible to perform.

What can we do for these 400 wounded? It has been suggested that we take care of them right on the spot by bringing up a 400-bed evacuation hospital. This sounds simple, of course, but it takes about 4 hours for such a unit to get into operation after it arrives on the scene. Unless it is completely empty of patients, packed, loaded and ready to move, it takes about 8 hours to tear it down and load it. This is too late, of course, but the question is academic since it is not likely that we will have such unit in reserve.

We could take care of the situation by evacuating the wounded by helicopters. This will *only* take about 200 H13's or 75 to 100 H19 helicopters! It is probable that the distance these patients must be hauled will be considerable. This question also is academic. We are in an age of atomic plenty but we do not yet have plenty of helicopters to depend on.

We could, of course, bring up three or four separate ambulance companies. They could lift the entire group of the wounded. This is not an impossible solution, but I think it is improbable that we will be able to get these units in such numbers on the field army troop list as to be readily available to support one or several atomic strikes anywhere along the army front.

These solutions may work if the army as a whole approves of them, accepts them, and is ready to pay, in troop spaces, for what it will cost to do the job in this manner. I am pessimistic that the planners of the field army troop list will deduct considerable numbers of precious troop spaces to provide for medical units to wait in ready reserve. It is true that Medical is not like Artillery, "never in reserve." But whatever medical means we have in reserve (that is, not busily committed at the moment) is earmarked for the direct support of *combat troops* which are *in reserve* at the *same time*. If CCC and CCB are both committed, and a serious atomic strike is delivered on one of the elements of CCC, the solution is *not* to yank away the medical support of CCB—it is still fighting, and it will probably have to fight *harder* very shortly. Likewise the solution is not to yank away the entire medical support in reserve with CCA, since they (CCA) will probably have to be committed to strengthen, replace, or pass through CCC. The medical elements in support of CCC will bear the brunt of their own medical job. They may be reinforced by a reasonable proportion of the medical support of CCB and CCA, but the guiding principle must be to provide medical support to the division *as a whole* and not to send all of it dashing off on a tangent toward one single group of casualties. If the enemy has thrown one atomic weapon at us he may throw another and even a third.

The obligation to make do with the means at hand will pertain even more directly in the case of a battalion which is isolated, or relatively isolated, in exploitation or in mobile defense. The battalion medical detachment must be prepared to assume the responsibility for conscientiously treating casualties in numbers which would normally swamp a full evacuation hospital. It must be prepared to hold these casualties for 12 hours or 24 hours, until evacuation can be accomplished under cover of darkness, or until the striking force has opened and safeguarded its route of communication.

This business of "disaster control" by closing down the shop to go over and help clean up a neighbor's mess worked well in the explosion at Texas City and in the tornado at Waco. It will work well in the communications zone, but it is completely unsuited in the zone of a combat division. The guiding principles there must *be CARRY ON with the mission,* and *MAKE DO with the means at hand.*

But are we not being naive in even suggesting that a battalion medical detachment can give even any token of medical care to 400 wounded? No, I think not. Fortunately, life and war and field medical service operations all are full of compensating and moderating factors. Not all these wounded will descend on the battalion aid station at one time.

And not all the wounded are of the same degree of severity. The battalion surgeon can make rapid and usually clear-cut decisions as to those whose wounds warrant the use of available helicopter and ambulance transportation; and those who are of lesser priority, and can either wait or go out by general purpose transportation; and those who have received minor wounds and, under the demanding circumstances of the immediate situation, can stay and fight for several days, if necessary before they are evacuated for definitive medical treatment.

The medics have been accustomed for some time to classify the wounded by the regions of the body affected. But we have given little expression to the distribution of wounded by degree of severity. True, about 25% of all wounded are hit in the upper extremity. Some of them may have a high velocity bullet through the shoulder, tearing away the bone, the joint, and the arteries and nerves, and perhaps even killing the patient from shock and hemorrhage. However, many wounds of the upper extremity are minor cuts and punctures or, say, amputation of a tip of a finger. As a rough rule of thumb, I consider that 20%, or less, of the wounded are to be considered critical. About 40% are seriously to moderately wounded. About 40%, or more, have actually sustained minor wounds.

What I mean by a critically wounded man is one who must reach an operating table in 6 hours or less if he is to have the best chance of survival. He requires a lot of professional work by the medical officer in the forward aid station. "First aid" will not save him. We may not be able to get these out in time.

Under the group of minor wounded are included all the various cuts, punctures, bruises and sprains that are not bleeding greatly, and which do not interfere with function other than to cause a limp or lameness. They require at most a cane or a sling to permit continuation of general function. Here too are the burns of less than 20% of the body surface.

These minor wounded can stay and fight. And the situation will usually demand that they do so. The enemy did not drop this bomb as an idle gesture—he is coming through. Back in garrison in peacetime, if a cook takes off the tip of his finger while slicing onions, or a recruit steps on a C-ration can top in the barracks, or a KP spills scalding water over one foot, we have a legitimate emergency, a reason to call an ambulance, and (unfortunately) there is basis for many, and lengthy, accident reports. But these wounds under conditions of two-sided warfare can be put aside from our consideration, at least until things cool down.

The seriously wounded men are those in the middle between these two extremes. These are people who have broken bones, single amputations, large flesh wounds and burns of 20 to 40% of the body surface. They probably *cannot* continue to fight. They require good medical treatment, but with a little bit of interim treatment their evacuation can be deferred for 6 to 12 hours or more with rather slight increase in danger to their life and little effect on their salvage for ultimate return to duty. I say that they *probably* cannot continue to fight. At least they cannot be *depended upon* to fight. When the situation is desperate, many of them *will* fight, sometimes along with a very few from the critically wounded group. I have seen a company commander, with a full burst of a burp gun in his belly, tighten his pistol belt over a large dressing and continue to lead his company until the objective was secured.

Hence we have cut down the battalion surgeon's job to the business of managing 100 critically wounded casualties, and 300 casualties with wounds which are serious, but whose treatment and evacuation may be deferred for a significant period. This problem is now within reasonable sight of practical solution.

It is, of course, impossible for the battalion aid station to maintain routinely more than a few pints of blood for immediate use. However, arrangements can be made for blood to come forward on the first resupply helicopter lift, when and if it is available. Meantime, any and every battalion aid station can carry 100 to 500 bottles of dextran, polyvinyl pyrrollidone, or one of the other plasma expanders which are now taking the place of plasma in the initial treatment of shock. This would amount to a load of less than 500 pounds. The bottles and cases can be stashed away in all the various trucks, trailers and litter jeeps of the medical detachment. This is enough, but barely enough, fluids to make a start in treating critically wounded patients. Admittedly, we must depend on early resupply in order to care for the less severely wounded. However, planning on the basis of such early automatic resupply is not unrealistic. We cannot expect every combat battalion to go forward into battle carrying a great bulk of litters, blankets, splints and plasma expanders—enough to carry out the complete program of treatment on every possible casualty. We can, I think, take reasonable stock in the proposition that an emergency medical supply lift can get forward when it is needed. This is a far more realistic proposition than the business of bringing supporting medical units into the area from the outside.

Perhaps half the wounds will involve the upper or lower extremity. Not all will be fractures, of course, but some of them will be multiple wounds of several extremities. Some of them will be large soft tissue wounds which require splinting of themselves in spite of the absence of fracture. The stock of splints and splinting material in the normal equipment of a battalion aid station is sufficient to care for these patients.

The biggest shortage will be litters. The average combat battalion aid station carries only about two dozen litters. These will have to be restricted to the business of *bringing in* casualties from the field of battle. Casualties arriving at the aid station will have to be off-loaded from litters onto the ground. It is practical and sound to plan on maintaining within the division, a ready "rolling" or "flying" reserve of medical supplies. The load I have in mind weighs approximately 12,000 pounds. For its weight it is quite bulky, but it can be readily broken down into automatic resupply packages to go forward in three 2½-ton trucks, or with each ambulance, helicopter, or truck that is used for evacuation.

What does the division surgeon do when he gets word of an atomic strike against one of the battalions of the division? In most plans I have seen he proceeds to the site along with other "disaster control" personnel such as the Engineer, the Signal Officer and the Provost Marshal. They engage in a rather elaborate survey of the situation, including measurement of radiation hazard. They proceed to collect various supporting elements from the technical service units of the division and to request such elements from field army. Thereupon they proceed resolutely to clean up the mess. I am inclined to feel that this process is not essential for immediate guidance and it will not work in battle.

No "survey" is required within the battalion area, at least not from the standpoint of the division surgeon. Roads may be blocked with debris and routes will have to be cleared. However, medical service cannot wait for this to be done. Ambulance drivers can and will find a way in and out. Radiation surveys surely will be made but no one should hold up prompt action pending their outcome. With the exception of the serious problem of fall-out from megaton weapons, the radiation hazard has been exaggerated far out of proportion to its actual importance.

Surely no survey of the size of the area or estimated KT yield of the bomb is needed for the division surgeon to plan his support of the stricken battalion. It should matter not one whit to him whether the bomb is 2-KT or 200-KT. All he needs to know immediately is that there is a "concentration of casualties" within the division zone. Such a concentration *normally* warrants a readjustment of the location and function of supporting divisional medical elements. Just because this concentration is the result of a nuclear weapon it does not have to be radical. As I have pointed out, if the division has been grouping its battalions at 2,000 yards distance from each other, the division surgeon can plan routinely on the requirement for evacuating 300 wounded within 12-24 hours following each strike.

So then I say that this is no time for despair—it is time for action. Unless you, the battalion commander, take action, that is, *tactical* action, the medical service will really have no problem at all. The position will be overrun, and our wounded will die in the POW enclosures of an unsympathetic enemy.

What *you* should do is to re-establish immediately your authority as a commander; make a fast call-up, or establish contact with your subordinate units by messenger; collect your survivors, including the minor wounded; organize them; get ready to fight; and stand fast.

Meanwhile, the battalion and divisional medics are taking the following steps in solving a problem which we have been taught is insoluble:

1. A call-up of medical units up and down the line, to determine the status of communication and the extent of damage to medical installations.
2. *No formal survey* of the situation in the battalion area. It will soon make itself clear of its own accord as *action* is taken.
3. A redistribution of the evacuation and treatment elements of the division, without stripping other combat units of medical service support which is essential to their own immediate combat operations.
4. The battalion medical detachment (what is left of it) functions as best it can, but according to normal pattern. It buckles down for a grueling 6, 12 or 24-hour grind. If the battalion aid station has been destroyed or severely damaged, close support by a divisional unit will assimilate its function and make an aid station unnecessary.
5. A pre-loaded medical supply package will be dispatched to the stricken battalion, and immediately replenished from the Army Medical Depot.
6. The utilization of evacuation transportation from the strike area will be strictly controlled by the battalion surgeon to insure proper priority for the wounded, and to prevent unnecessary loss of individuals with trivial wounds.
7. The evacuation of the minor wounded will be deferred.

No, gentlemen, when an atomic weapon hits your battalion, it is time for action, but it is no time for despair.

CHANGE OF ADDRESS

Effective the first of May, the Armor Association's office will have been moved from *1727* K Street, N.W. to *1757* K Street, N.W., Washington 6, D. C. Parking lots and new buildings continue to close in. However, the new location is a more modern office building which should enhance the prestige of the Association. It also lends an air of permanency to the Association's Headquarters. We hope we shall not have to move again for some time to come. While on the subject of moving, we would appreciate your keeping us informed when you move.

MEMBERSHIP STATUS

This is being written as we close our issue (except for the report of the meeting) prior to our departure for Fort Knox. We are gratified in having received replies from about two-thirds of our membership who were asked if they would attend our 67th Annual Meeting—the largest response we have ever had. Also many members took advantage of the opportunity to check their addresses, which pleases us no end. We are thus able to continue uninterrupted service to you. However, many members were not sure of their membership status. So many in fact that we believe it wise to spell out the types of membership in accordance with our Constitution. We quote from ARTICLE IV—Membership and Qualifications for Membership: 1. Members of the United States Armor Association are classified as follows: (a) Active Members, (b) Associate Members, (c) Honorary Members, (d) Junior Members. 2. The qualifications for membership are as follows: (a) Active members: All general officers of the Regular Army or Army of the United States, and all present and former officers and warrant officers of honorable record assigned to, detailed in, or who have served in Armor shall be eligible. (b) Associate members: All other present and former commissioned officers, warrant officers and noncommissioned officers, of honorable record in the military, naval or air service, shall be eligible. (c) Honorary members: Persons distinguished in military, naval or air service or learning shall be eligible upon election by a majority vote of the Executive Council. Such members shall not be subject to the obligations of active or associate members nor entitled to the right either to vote or to hold office. Otherwise they shall have the privileges of members, including the privilege to attend meetings and to engage in discussions. (d) Junior members: Students of the Service Academies, Military Schools and ROTC institutions shall be eligible. Annual dues shall be at a reduced rate as determined by the Executive Council. Such members not to be entitled to vote or hold office; otherwise they shall have the privileges of members. Where we refer to *active members,* many members confuse this as meaning *active duty.* Such is not the case. All officers who have served in Armor are eligible to be *active voting members* regardless of their present status. For example, many Armor officers are presently assigned to Reserve components. We want it clearly understood that they are active members entitled to vote. Likewise, many retired officers who have served with Armor felt that they were not active members. This is erroneous; it is spelled out in the excerpts from the Constitution quoted above. (See Letter to the Editor from General Lininger.) We might state here that since Armor is a continuation of Cavalry, the latter is by no means excluded from eligibility to membership, even though the branch is not specifically named in the Constitutional qualifications.

LOCAL ASSOCIATION CHAPTERS

We have received several requests for information as to the procedures for establishing local chapters. The local Washington Chapter was established by an independent group of Armor officers who felt that there was a need for periodic meetings for exchange of information concerning the mobile arm where most of those officers in attendance are not presently on Armor assignments. It was also felt that this would serve to bridge the gap and assist in keeping the attending officers informed of current happenings within the mobile arm. The District of Columbia Chapter, although not a formal subdivision of the National Association, certainly receives the official blessings of this office.

DEADLINE DATES

Since we have moved up our publication schedule, many members have inquired about the deadline dates for the submitting of material. We like to have material for a forthcoming issue in our hands by the first of the month preceding the month of publication. For example, material for the January-February issue should be in the office by the first of December. For the March-April issue, we like to have the copy in by the first of February. Even then we cannot guarantee that it will be published at that particular time. Where the material is newsworthy as regards the time of release, we undoubtedly will get it in. But where this factor is immaterial, we might have to schedule the article or articles for a subsequent issue.

EQUITATION

With the advent of spring we received many inquiries concerning the possibility of obtaining manuals on horsemanship. The Army manuals are entirely out of print and we do not have copies available here in the office for sale. We have been able to advise several parties who have inquired that they can secure certain films on horsemanship from Army film libraries to assist them with their instruction. The one book we have available which is considered the best in the field is "Riding and Schooling Horses" by Brigadier General Harry Chamberlin. Anyone interested in obtaining either single copies or bulk lots for use by students of equitation may write to this office for price quotations. Just let us know the number desired.

The Editor

FROM THESE PAGES

65 Years Ago

The charge is the very acme of cavalry life. As the brook leads to the river, which in turn flows to the ocean, the sum of all waters, so the charge is the life element of cavalry, and all instruction should point to it as the grand consummation of cavalry existence. The mode of its execution may not always give it success, but it certainly does fix its value as cavalry. The alignment must be good, the men riding stirrup to stirrup. The charge itself should cover from eighty to one hundred and fifty yards, the speed somewhat regulated by the utmost paces of the weakest horses, the officers in front where all the men can see them, the latter riding resolutely with no hanging back. The thought should be absorbed by the business in hand, and at the command "Charge," "all should commend their souls to God and charge home."

Previous to the charge scouts should be sent to the front to observe the ground which is to be passed over before reaching the enemy, in order to give warning if there be any impassable obstacles, such as wide ditches, sunken roads, or any obstruction that would break the formation or create confusion in the ranks, but under no circumstances must these detached men or parties rush directly back to the lines, thereby bringing disorder into the ranks.

Captain A. E. Wood

The Proper Employment of Cavalry in War

50 Years Ago

The one unchanging factor in warfare is the individual physical strength of a man. The soldiers of Caesar's army were physically no stronger nor weaker than our own. Progress in the art of war, therefore, consists in the realization of certain fundamental conceptions from time to time, and the seizure of one idea at a time, working it out in detail, and applying it before an enemy realizes its importance. These fundamental ideas have been slow to impress themselves upon military leaders, and, therefore, that nation which first takes hold of a new fundamental principle in war, and works it out with the greatest perfection in time of peace, possesses an insuperable advantage when suddenly the conflict is precipitated.

Frederick the Great inherited an army which had been trained in peace, and he soon found that he could march all around his enemies and strike them where he pleased. Napoleon, for the first time, grasped the importance of the relation between the ground and the battle, and developed this single idea until the French nation led the world in war. The electric telegraph was then unknown, but it is not too much to say that if there had been on duty with Napoleon's army at Waterloo a single trained company of signal troops, such as is now at the U.S. Signal School, the history of modern Europe would probably have been different.

Major George O. Squier

"Team-Work" in War

25 Years Ago

In the development of tanks, and tank organizations, it must be remembered that certain important considerations apply to the employment of tank units in war.

Among these are:

Tanks will be difficult to procure in large numbers, particularly in the early stages of any war.

Opportunities for their best employment on the battle front must be carefully selected, both as to time and as to place. They are assault weapons only, to be used for relatively short periods of time, under favorable opportunities.

Maintenance will offer many difficulties, particularly in the areas of front line divisions.

"All these considerations indicate the desirability for visualizing tank units in war as Corps, Army, and G. H. Q. troops. In the develop of the tank, due regard must be paid to the necessity for strategic mobility, even though its fundamental qualification must be tactical mobility.

"The 'tank' is properly the term that will be used when this vehicle is employed with infantry. When it is employed as a part of the equipment of cavalry, it may be developed to possess characteristics particularly requisite for such service, and it might then be given the name 'combat car.' "

War Department Release

Mechanized Force Becomes Cavalry

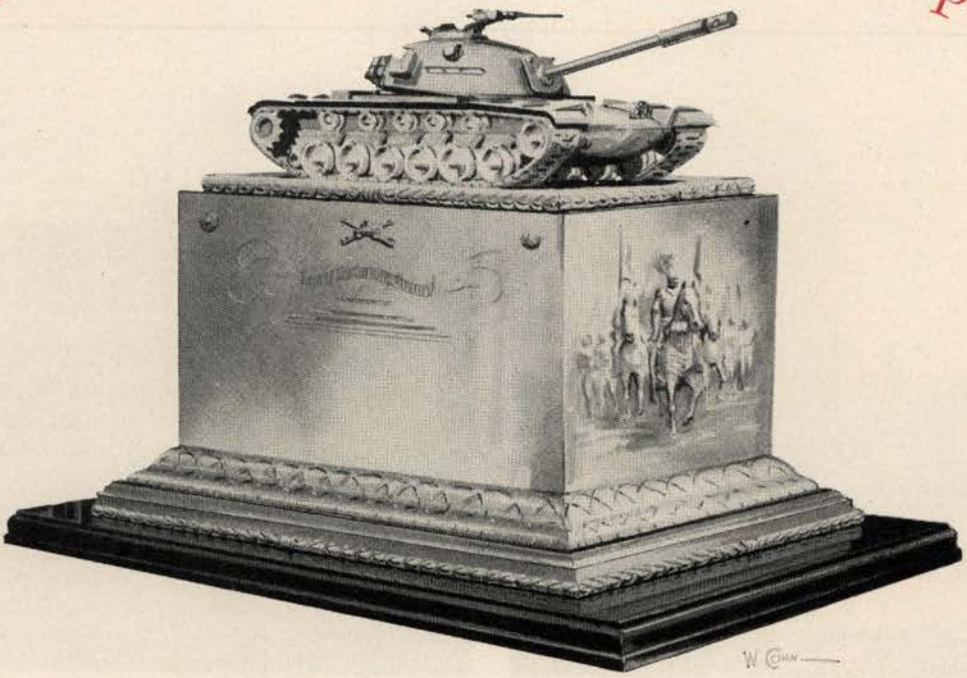
10 Years Ago

Aside from a few special situations, tanks on an offensive mission engage the enemy by closing with him during an advance. In such an operation the tank comes under observation and fire of any enemy tank or antitank weapon, or comes unexpectedly upon other enemy forces. In either case, the tank is usually moving when it sights a target. The success of its mission, and in most cases the safety of the tank and crew, depend upon the ability of the crew to take the enemy target under fire effectively within a few seconds; in short, to "shoot from the hip and hit." Such shooting is not done at long ranges—100 to 600 yards is the rule. The tank fires to hit on its first shot. It must out-shoot the enemy to live. Each member of the crew must be trained to proficiency in his particular job in order that the crew may be able to take a surprise target under fire quickly and effectively. In addition, the crew must be trained as a team in order that all of the several actions required of the members can be performed quickly in proper sequence, so that the first shot is fired promptly and sensed properly and subsequent shots, if necessary, follow the first in rapid succession, with proper and immediate corrections applied.

Brigadier General Bruce C. Clarke

Tank Combat Firing

The Armor Leadership Award Trophy



By COLONEL HENRY C. NEWTON

WITH the revival of the Armor Leadership Award, as reported in the March-April issue of *ARMOR*, the problem of design of a suitable trophy was a matter of considerable interest. The author, who is the Director of Instruction at The School, was given the task of designing the trophy. A series of studies were made under his direction by Master Sergeant William M. Conn whose work is well known to all Armor personnel. The studies were submitted to CONARC and one design was approved. Rather elaborate drawings were made of the trophy and bids are now being received from manufacturers in both the United States and Europe covering the cost of the completed trophy.

It was realized that a trophy of this nature should be impressive, yet simple, and that it should be of sturdy construction, bearing in mind the problem of wear and tear over the years. It seemed it would be logical that the trophy should represent, in its design, the background and tradition of the Cavalry arm and its evolution throughout the years to Armor.

The trophy will be of silver mounted on a base of Belgian Black marble—10″ in width and 16″ in length. The over-all height of the trophy from the base to the top of the tank turret is 12½″. The base is gradually built up with a series of decorative moldings to the plain silver shaft which is crowned with an exact replica of the M48 medium tank. The longer face of the silver shaft is without ornament, to permit the carving of the names of the successful competitors. The ends of the shaft carry a decorative panel in hand-wrought raised silver depicting the development of the Cavalry arm. One panel carries as its principal element a mounted knight in full armor followed by his retinue all mounted with pennants flying. The figure of the knight will dominate the design and will project approximately one-half inch, while the lesser figures will die out as they recede into the background.

The opposite end carries a similar panel; however, the dominant note in this plaque is the cavalryman of the Western Plains, with a group of troopers, Indians and scouts fitting into the background and of the same general character as the panel described above.

One of the most difficult problems in the manufacturing of the trophy is the casting of the tank. A miniature of the tank was obtained of the exact size required. This miniature will serve for the making of the wax impression from which the silver will be cast. Due to the intricate detail, it will be necessary to cast the tank in four sections. The sculptor will then weld the pieces together by hand and carve the ornament so as to exactly reproduce the vehicle. Upon completion, the hollow portion of the shaft and tank will be filled with liquid plastic so as to give the whole unit rigidity. There will be no moving parts.

It is felt that the design emphasizes the background of the Cavalry tradition and its gradual evolution into the striking force which symbolizes Armor with its mobility, firepower and shock action.

Suitable individual awards will also be made available for the personnel of the winning platoon and a plaque will be designed for permanent retention by the various winning organizations.

It is hoped that satisfactory proposals will be received soon, and the trophy should be completed in about three months after the awarding of the contract.

THIRD ARMORED DIVISION

U. S. Army

A tank of the Aggressor Forces prepares to fire on the friendly jeep which it sighted in the edge of the woods.

U. S. Army

A machine gun squad protects rear of tank column against Aggressor ground troops as battalion moves into position.

By PRIVATE FIRST CLASS JAMES L. WOHLNER

THE Third Armored Division (Spearhead), recently completed advanced unit training prior to the Division's forthcoming Gyroscope movement to Germany. Essential elements in this training were the Tank Battalion Tests administered to the division's four tank battalions by Combat Command B under the command of Colonel Harry E. Lardin.

Conducted on difficult terrain under changing, and at times difficult climatic conditions, the battalion tests were designed to determine the efficiency of the tank battalions of the Division under conditions simulating those of a typical combat mission. In addition, the tests were determinants in the proficiency of the command, staff and logistical sections of the battalions.

The battalion tests were preceded by Tank Platoon and Tank Company Tests and were designed to evaluate the cohesive abilities of the platoons and companies of the battalions. In all cases, the tank battalions were supported by an armored infantry rifle company, an armored field artillery battalion, an armored engineer platoon and a tactical air control party.

Both the aggressor forces and the battalions being tested utilized equal air support. Light L19 aircraft, dropping colored smoke bombs, represented tactical air. CBR and intelligence were also played throughout the tests.

The tests were conducted in five continuous phases:

1. *Assembly*. A night march to an assembly area prepared to attack on order. From IP time to closing, the march took from six to eight hours depending on terrain conditions. Battalions were given only the minimum time in assembly area prior to execution of the attack phase.

2. *Attack*. The reinforced battalion attacks as a flank task force of the combat command and secures the first objective. The attack continues and as two teams reach the intermediate objective strong enemy attacks force a change in mission.

3. *Mobile Defense*. The task force is given the mission of establishing a strongpoint on the first objective. This mission entails withdrawal of the two teams that had reached the intermediate objective and organization of the position.

4. *Withdrawal and Position Defense*. Aggressor continues pressure and reinforcement. The task force is ordered to withdraw and establish a strong position defense with reduced frontages. Aggressor action against the position requires the task force commander to commit his support team.

5. *Relief*. An Infantry unit relieves the task force in place. Relief is played by umpires representing infantry commanders. By team, the task force moves to new assembly area.

The tests were held in December 1955 and January 1956 in every type of adverse weather condition. Rain, snow, mud and extreme cold were some of the major obstacles to be overcome. In spite of the inclement weather conditions, maintenance was performed in the field at a sufficient rate to keep the battalions at maximum operating efficiency.

TANK BATTALION TESTS

U. S. Army

Friendly tanks moved into position and are firing on Aggressor infantry and tanks making an unexpected attack.

U. S. Army

Fire power and mobility are demonstrated as the Friendly Forces mount a counterattack against the Aggressor.

Combat Command Headquarters, operating in the field, controlled the tests by issuing appropriate orders, by providing information on friendly units and by maneuvering aggressor in order to achieve a desired situation. Umpires from Combat Command B, led by Lt. Colonel James K. Tanner, Chief Umpire and Executive officer, CCB, exercised umpire control in a realistic manner. The scope of umpire control was all-encompassing. Each company was assigned an umpire, as were each of the staff and command sections. There were aggressor, communication, air, infantry and artillery support umpires gauging the use of supporting units by the battalion being tested. Explanations for hold-ups, losses and casualties were given on the spot to company and tank platoon commanders so that their errors could be impressed upon them as they occurred. Suggestions for correction or improvement of methods employed were also made at once.

In all cases, the umpire decisions were prompt and consistent with the circumstances of the test.

Intelligence training is often inadequately tested unless it is given special attention. For the Third Armored Division's Battalion Tests the Aggressor Force was chosen from units of the 83d Reconnaissance Battalion, commanded by Lt. Colonel Charles J. Girard. Men of the 83d Reconnaissance Battalion who had a speaking knowledge of a foreign language were included as members of the Aggressor Force. These individuals when captured provided a realistic atmosphere for prisoner interrogation. Captured documents, if correctly analyzed, provided worthwhile information on aggressor plans.

Realism was stressed throughout the tests, from the initial night march to the assembly area under strict blackout conditions to the relief in place. Tear gas, blast simulators, smoke pots and propaganda leaflets were in constant use day and night throughout the exercises. These, and other implements of realism, all contributed to the overall effectiveness of the tests and kept the participants energetically and enthusiastically alert. Everyone involved from tank gunners to battalion commanders found it vital to think and act quickly. It was noted that as each battalion progressed through its respective tests, staff procedures steadily improved.

Experience and know-how gained from the tests have proven invaluable for both the tankers and their commanders. A great percentage of enlisted men in the tested battalions had joined their units as untrained fillers in July and August 1955. The tank battalion tests were their first close look at a simulated combat situation on a large scale. One young tanker was heard to comment upon completion of the attack phase of his battalion's test, "So that's what it's really like."

PFC JAMES L. WOHLNER received his education at Grinnell College, Iowa. He was station manager and news writer on station KGRW. He also served as a United Press correspondent. Immediately prior to coming on duty he was employed by *Down Beat* magazine. He is presently with the advance detachment, CCB, Third Armored Division in Europe.

NEWS NOTES

Improved Fuel Economy Through Fuel Injection

The utilization of fuel injection instead of carburetion on tanks and other heavy combat vehicles has provided a major step in the Army's engine program which has fuel economy as one of its principal objectives.

Tests conducted at CONARC Board Number 2 and Aberdeen Proving Ground on vehicles equipped with the AOS 895-3 engines, which include the M41A1 Light Gun Tank, the M42 twin 40mm Duster, Cargo Tractor M8A1 and the Howitzer 105mm SP M52, have demonstrated increased cruising range with fuel injection of up to 22% over the same vehicles equipped with carbureted engines.

Test results have shown that the greatest increases in fuel economy were obtained under conditions of three quarters to full throttle operation. When the engine is at idle the fuel savings drop to approximately two to three percent. This means that to obtain the maximum benefit from fuel injected engines commanders must still insist on *cut engines* at every opportunity.

The increase in cruising range or fuel economy is attributed to the fact that the fuel injectors deliver the fuel charge to an area near the intake valve which insures an equal charge being delivered to each cylinder. This eliminates one of the disadvantages of a carbureted system where some cylinders are running rich.

COMMAND CHANGE

All Photos U. S. Army

Maj. Gen. John L. Ryan, Jr.
CG, The Armored Center

Other advantages to the user of fuel injection over carburetion are:

1. Induction System Icing: Since the carburetor is eliminated, problems of icing are also eliminated with fuel injection.
2. Vapor Lock: Fuel injection systems are under slight pressure and therefore are less susceptible to vapor lock as compared to systems operating under atmospheric or slightly less than atmospheric pressure.
3. Hydrostatic Lock: Loading the manifolds with fuel which has by-passed the carburetor float valve is no longer a possibility with fuel injection systems since the injector must be in operation to permit fuel to be delivered to the manifold.

As a result of the highly encouraging test reports on fuel injection the Army has directed that all future AOS 895-3 engines produced be fuel injected and designated AOSI 895-3. A program is under way to convert AOS 895-3 engines in the field to fuel injection by kit modification. The M48A2 tank which starts coming off the production line this June will have a fuel injected engine, the AVI 1790-8.

Army Aviation Training

The Department of the Army will assume responsibility for the conduct of

COMMAND CHANGES

General Willard G. Wyman
Commanding General, CONARC

Lt. Gen. Edward T. Williams
Deputy CG, CONARC

General Henry I. Hodes
CINCUSAREUR

TO RETIREMENT

General John L. Dahlquist

General Anthony C. McAuliffe

Maj. Gen. Charles V. Bromley, Jr.

aviation training required in support of Army activities.

The responsibility to be transferred to the Army will include aviation training in courses now conducted for the Army by the Air Force.

Assumption of training responsibility does not modify current roles and missions of Army aviation nor authorize expansion of the Army aviation training program beyond roles and missions recommended by the Joint Chiefs of Staff and approved by the Secretary of Defense.

The Army will develop plans for transferring Army aviation training and coordinate these plans with the Air Force. The Air Force will transfer Edward Gary Air Force Base, Texas, and Walters Air Force Base, Texas, to the Army, in order to achieve maximum practical utilization of existing facilities and personnel.

Army to Train 15,000 ROTC Cadets this Summer

The United States Army will train more than 15,000 Reserve Officers Training Corps cadets at installations throughout the country this summer, the Department of the Army recently announced.

Each of the cadets will be given a six weeks advanced training course. Instruction will be started in June.

ROTC summer camps will be conducted at the following Army installations: First Army: Fort Devens, Massachusetts. Second Army: Fort Belvoir, Fort Eustis and Fort Lee, all in Virginia; Fort George G. Meade and Aberdeen Proving Ground, both in Maryland; Fort Knox, Kentucky. Third Army: Fort Benning, Georgia, Camp Gordon, Georgia; Fort Bragg, North Carolina. Fourth Army; Fort Sill, Oklahoma, Fort Hood, Texas. Fifth Army: Fort Leonard Wood, Missouri; Fort Riley, Kansas. Sixth Army: Fort Lewis, Washington.

The 1956 program will emphasize practical work and field training. Students will have an opportunity to serve as leaders, apply actively the theoretical instruction received in classrooms, fire many of the Army's new weapons, and learn how to use weapons under field conditions.

COMMAND CHANGES

Lt. Gen. Bruce C. Clarke
CG, Seventh Army

Maj. Gen. Clark L. Ruffner
Chief MAAG—Germany

Brig. Gen. C. Stanton Babcock
CG, 2d Armored Division

news from THE ARMORED SCHOOL

General Plans for Instruction

Plans for the year starting 1 July 1956 indicate that there will be no major changes in the integrated courses to be presented at The Armored School. The Armor Officer Advanced Course (17-0-3) will again be a 35-week program of instruction designed to train officers in the duties and responsibilities of field grade Armor officers. The Associate Armor Officer Advanced Course (17-0-4) and the Associate Armor Company Officer Course (17-0-2) will be 16 weeks in length. These two courses provide comprehensive programs for the reserve component officer and the Regular Army Officer requiring refresher or supplemental training. The Armor Officer Basic Course (17-0-A) provides the minimum essential Armor training required by the newly commissioned officer to enable him to perform the duties as a platoon leader of a tank or reconnaissance company. This course is also 16 weeks in length.

Two refresher type courses for officers will be continued next year: the Armor Officer Refresher Course (17-0-12) for active duty personnel and the Armor Officer Refresher Reserve Component Course (17-0-13). Both of these courses are 2 weeks in length. The Armor Advanced Noncommissioned Officer Course (17-E-13), designed to train enlisted personnel for the NCO skill level of MOS in the 13 series (.6 and .7), will be a 16-week course.

Certain common subjects will receive greater emphasis in next year's programs of instruction. New units of instruction covering "The Army's Role in Civil Emergencies" will be presented; this is a new subject matter area and one which is very appropriate for the modern military leader. Twenty-two hours in this subject will be scheduled for the Advanced Course. Instruction in "Atomic Warfare" will be greatly increased in the Advanced Courses next year; at least 55 hours in this subject will be presented. Also, next year's POIs will include units of instruction on "Weather."

Specialist Courses

Armor has the inherent capability to produce decisive results when its mobility, firepower and shock action are effectively employed against an enemy. To maximize the integration of these characteristics, a commander must have complete control of his units through efficient communication, and must have the maximum number of effective vehicles at his disposal. To accomplish this end, a commander requires the services of capable Communication and Maintenance Officers.

It has long been recognized that there exists a paucity of trained Armor Communication and Motor Officers. In part, this condition can be attributed to the unwillingness of commanders to send their officers to The Armored School to be trained in these specialist fields. Another reason is that many officers have shied from a Communication or Motor Officer assignment for fear of being identified as a specialist, which might cause them to be restricted to these areas in subsequent assignments.

To aid in combating the present lack of trained Communication and Motor Officers, The Armored School has rewritten the programs of instruction for these two courses with a view toward making them attractive to commanders and to potential students themselves. The Motor Officer Course has been reduced to 14 weeks in length; the Communication Officer Course has been reduced to 10 weeks in length. By shortening the courses, it is hoped that commanders will be less reticent about sending officers of their units to The Armored School for training in these specialist fields. In this manner, a greater pool of trained Communication and Motor Officers will be developed, thereby removing the other obstacle to providing Armor with these trained officers: that is, the provision of sufficient numbers trained in these specialist fields to ensure that an assignment as a Motor Officer or Communication Officer will not "doom" the officer to a series of like assignments. With more trained officers to draw from as a result of commanders taking advantage of the shortened courses, Armor as a whole will not be forced into repetitious assignment of any one small group into the same type assignments over a period of years.

School training of enlisted personnel as specialists to support the new MOS code is provided in five courses. Communication specialist duty positions in Armor units are provided in the Armor Radio Maintenance Course (17-E-2), a 12-week course for enlisted personnel training for MOS 312.1, and the Armor Communication Supervision, Enlisted Course (17-E-1), a 5-week course which trains for the NCO level, MOS 312.7. Specialists are trained in the field of organizational maintenance for Armor vehicles in the Armor Track Vehicle Maintenance Course (17-E-3), a 10-week course designed for the MOS specialist level, and the Armor Automotive Supervision Course (17-E-7), an 8-week course which trains for the NCO level. The turret mechanic is school trained in the 9-week Turret Maintenance Course (17-E-4), which provides a comprehensive program of instruction in organizational maintenance of the turret-mounted weapons and turret mechanisms of tanks.

Our Allied Legion

It is a known and established fact that The Armored School develops and teaches the tactics and techniques employed by the Armor units of the United States Army, to include the armored division, tank and reconnaissance units of the infantry and airborne divisions, the armored cavalry regiment, and the armor group. A lesser known facet of The Armored School is that it also trains officers and enlisted personnel of the armies of our allied nations. Since 1 January 1948, 1036 Allied students have graduated from the School. This distinguished list of officer and enlisted graduates have carried the doctrine of Armor into the field throughout the world. In the performance of its basic mission of developing and teaching the tactics and techniques of Armor, The Armored School exercises a profound influence on not only the American fighting team but also the armies of our Allies.

As many as 35 nations have been represented at The Armored School at one time. At the present, there are 27 countries represented by some 118 students.

Needless to say, The Armored School has had some problems arising from language difficulties, differences in customs, uniforms, protocol, etc. Most of these problems have been resolved by the Allied Liaison Section, which is a part of the Office of the Secretary of The Armored School. Though many problems initially have been difficult to solve, the Allied Liaison Section has yet to be confronted with one to which a solution cannot be found.

Aside from the opportunity presented to the Allied officer for learning United States Army methods, tactics, techniques and equipment, the Allied officer attending The Armored School is a representative not only of his Army but primarily and foremost of his country; he is an unofficial ambassador of good will. Many opportunities are available to him to associate not only with the military personnel but with the average American citizen as represented by the man on the street—"Mr. Average American," whether he be the corner pharmacist, the local barber or the steward at the horse farms in the bluegrass country of Kentucky. The Allied officer is a welcome and honored guest of the average American, whether it be the local Kiwanians, Rotarians, Lions or "Mr. Smith, the local garage mechanic." To further solidify the bonds with our brothers-in-arms, continual effort is made to familiarize them with the American social and economic life through guided and conducted tours of our industries and sponsored contacts with social and civic groups.

Upon graduation, the Allied officer returns to his country qualified professionally in the field of Armor, but most important he has established a fundamental basis of understanding between our people and his; he has been given an opportunity to understand the American way of life.

Departments Merge

The Nonresident Instruction and Training Literature and Reproduction Departments of The Armored School merged on the first of March.

The new combined organization, to be known as Nonresident Instruction Department, will be directed by Colonel Vincent L. Boylan.

The missions and activities of the former two departments remain unchanged under the new merger.

THE ARMORED SCHOOL HONOR GRADUATES

The following students received top scholastic honors of their classes.

Armor Officer Basic Course Number 2

2d Lt. Bruce H. Williams, 11th Armored Cavalry, Fort Knox; military stakes, 2d Lt. Graham F. Byrnes, 1st Armored Division, Fort Polk.

Armor Officer Basic Course Number 3

2d Lt. Cortez A. Cooper, Jr., 1st Armored Division, Fort Polk; military stakes, 2d Lt. Thomas W. Wilke, 82d Airborne Division, Fort Bragg.

Armor Communication Officer Course Number 1A

Capt. Jack M. Tiller, 36th Armored Infantry Battalion, 3d Armored Division, Fort Knox.

Armor Advanced NCO Course Number 3

SFC Paul V. Boals, Company B, 30th Tank Battalion, Fort Knox. Armor Leadership Award team: *team leader,* MSgt. Paul R. Zempter, H&S Company, 894th Tank Battalion, Fort Knox; *team members:* MSgt. Wade H. Earley, Company C, 30th Tank Battalion, Fort Knox; MSgt. James Epps, Company L, Student Regiment, TAS, Fort Knox; SFC Norman M. Fabry, Company A, 33d Tank Battalion, 3d Armored Division, Fort Knox; Sgt. John G. Dietz, Headquarters Company, 13th Armored Infantry Battalion, 3d Armored Division, Fort Knox; SP-2 Arvil Dobson, Company B, 30th Tank Battalion, Fort Knox.

Armor Automotive Supervision Course Number 3

SFC Norman L. Johnson, Tank Company, 133d Infantry (Iowa National Guard), Webster City, Iowa.

Armor Turret Maintenance Course Number 5

Pvt. Arthur J. Pollack, H&S Company, 83d Reconnaissance Battalion, 3d Armored Division, Fort Knox.

Armor Track Vehicle Maintenance Course Number 10

Pvt. Robert S. Harris, 41st Tank Battalion, Fort Carson.

Armor Radio Maintenance Course Number 5

Pvt. Donald E. Rericka, 1st Tank Battalion, 1st Armored Division, Fort Polk.

Armor Radio Maintenance Course Number 6

Pvt. Joseph A. Weber, H&S Company, 37th Armored Infantry Battalion, 3d Armored Division, Fort Knox.

"How would you do it?"

AN ARMORED SCHOOL PRESENTATION

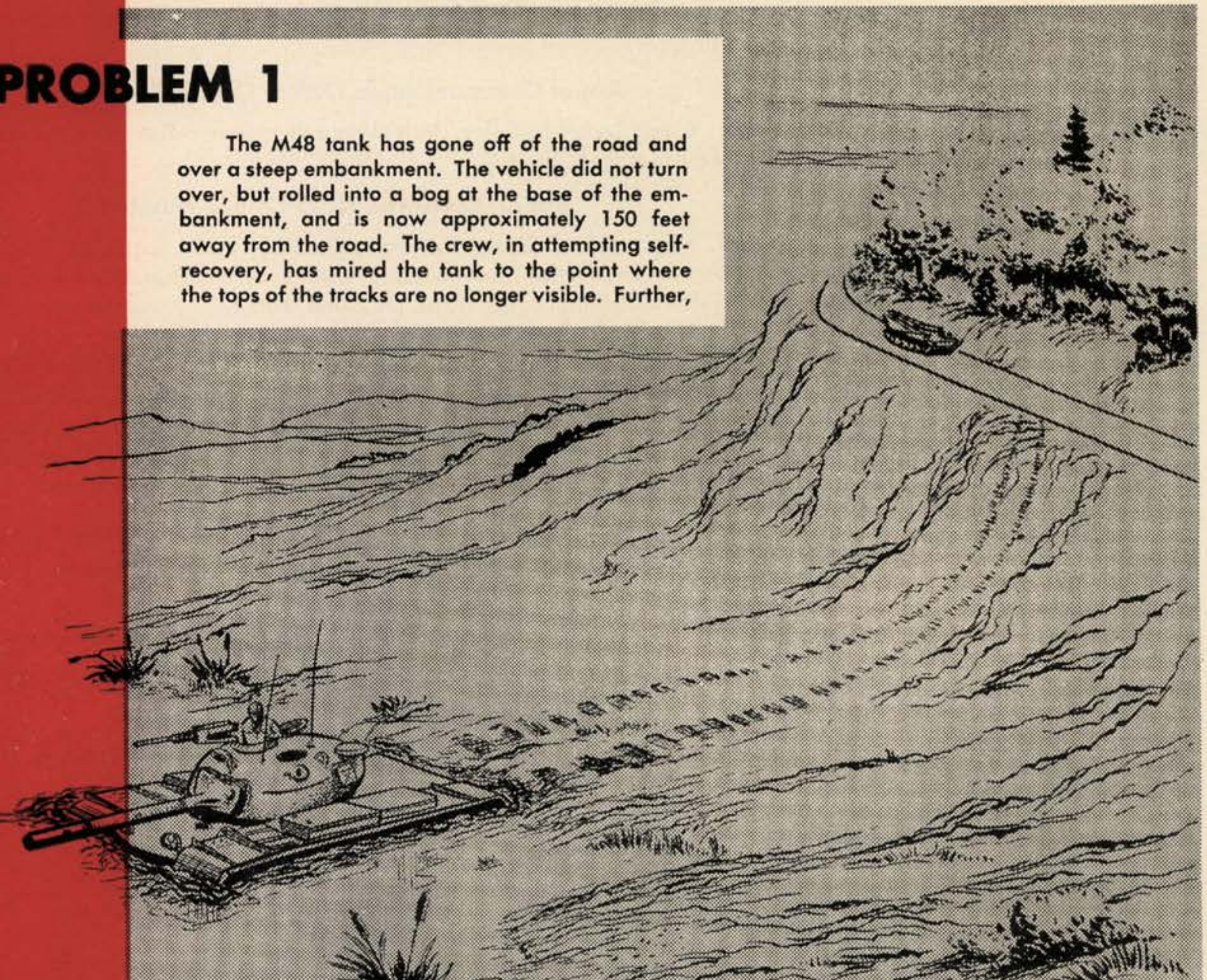
SITUATION

301st Armored Division is acting as the covering force for L Corps. Task Force ROCKER (1st Tank Battalion reinforced with Company A, 101st Armored Infantry Battalion), part of CCA, is displacing to the rear under cover of darkness to occupy the next combat command delaying position. During the blackout march, one M48 tank and one M59 armored infantry vehicle of Team BAKER (Company B, reinforced) became disabled. The company maintenance section is required to recover all disabled company vehicles and evacuate them to the battalion vehicle collecting point, a distance of approximately eight miles.

You are the Executive Officer, Company B, 1st Tank Battalion. In your maintenance section you have available to you an M74 tank recovery vehicle. This vehicle has a main winch with a 45-ton capacity, and 200 feet of 1¼-inch cable (the cable has greater strength than the winch capacity). In addition, two snatch blocks for use with the main winch cable, two 10-foot tow cables, and a V-type rigid tow bar are provided as part of the OVM. The M74 is capable of negotiating a 60 per cent slope under favorable conditions. How would you effect recovery and evacuation of the vehicles in the following cases?

PROBLEM 1

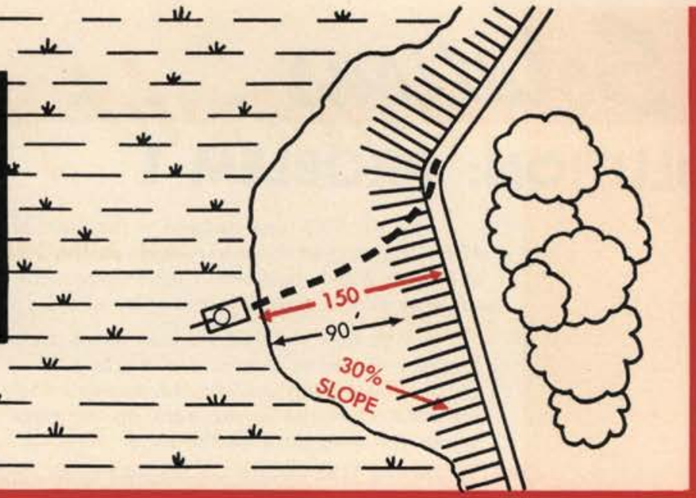
The M48 tank has gone off of the road and over a steep embankment. The vehicle did not turn over, but rolled into a bog at the base of the embankment, and is now approximately 150 feet away from the road. The crew, in attempting self-recovery, has mired the tank to the point where the tops of the tracks are no longer visible. Further,



AUTHOR: LT LEE E DUKE

ILLUSTRATOR: MR JACK H BAIN

the oil cooler fans are no longer functioning, and the engine and transmission have been excessively overheated. A short strip of fairly flat, firm, rocky ground, approximately 90 feet wide, extends from the foot of the embankment to the edge of the bog at the point where the tank left the road. The slope of the embankment at its gentlest location bordering the solid strip of ground is approximately 30 per cent. How would you recover this tank and evacuate it to the battalion VCP?

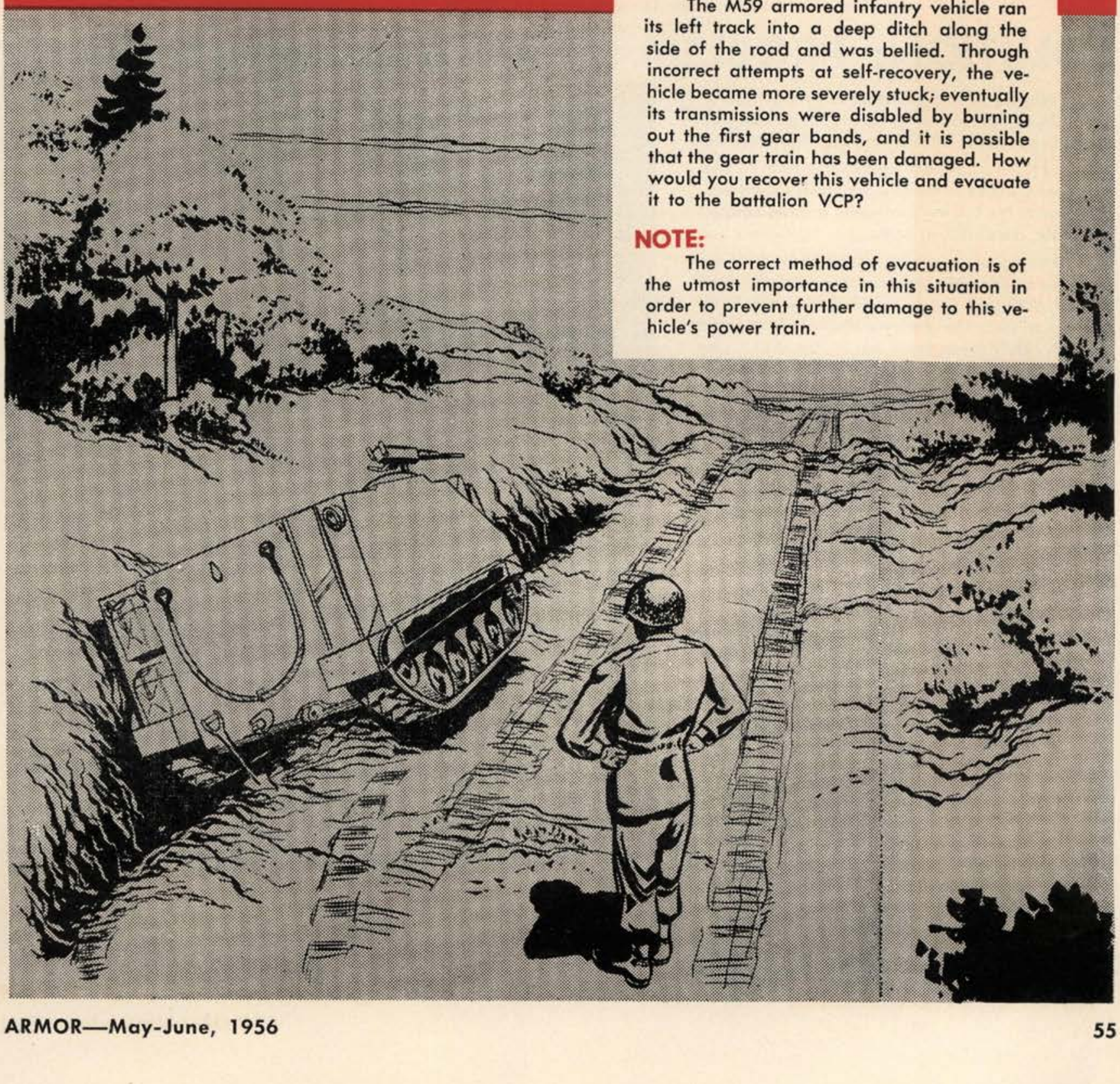


PROBLEM 2 - - - - -

The M59 armored infantry vehicle ran its left track into a deep ditch along the side of the road and was bellied. Through incorrect attempts at self-recovery, the vehicle became more severely stuck; eventually its transmissions were disabled by burning out the first gear bands, and it is possible that the gear train has been damaged. How would you recover this vehicle and evacuate it to the battalion VCP?

NOTE:

The correct method of evacuation is of the utmost importance in this situation in order to prevent further damage to this vehicle's power train.



Solutions . . . .

SOLUTION: PROBLEM 1

An M48 tank bogged in the manner described would present a dead load in excess of the 45-ton capacity of the main winch on the M74, thus necessitating the use of snatch blocks to gain at least a 2-to-1 mechanical advantage with the main winch cable. With only 200 feet of main cable available, recovery cannot be effected from the main road, a distance of 150 feet away.

The M74 should be driven down the embankment at its gentlest location onto the solid strip between the embankment and the bog. From this position, it could use as high as a 3 to 1 hookup, giving it a pulling capacity of approximately 135 tons to winch the M48 onto solid ground. Then the M74 would be driven back up the slope onto the road, from which position it could easily winch the M48 up onto the road.

CAUTION: The M74 should not attempt to tow the M48 up the 30 per cent slope onto the road. This would almost certainly break the final drives of the M74.

NOTE: Should the slope of the embankment exceed 60 per cent, or be of such a nature as to provide insufficient traction for the M74, the M74 should be self-winched down the slope, perform the initial recovery, and then be self-winched back up the slope.

After the M48 is winched onto the road, the M74 should tow it to the battalion VCP, using the rigid tow bar from the M74. First, however, the power train of the M48 should be disconnected at the universal joint to the final drive on both sides of the vehicle to prevent further damage to the cross-drive transmission. Never exceed 12 MPH while towing any type tank.

SOLUTION: PROBLEM 2

Recovery in this situation is simple. Either the M74 or one of the company tanks can pull the M59 out of the ditch by means of tow cables.

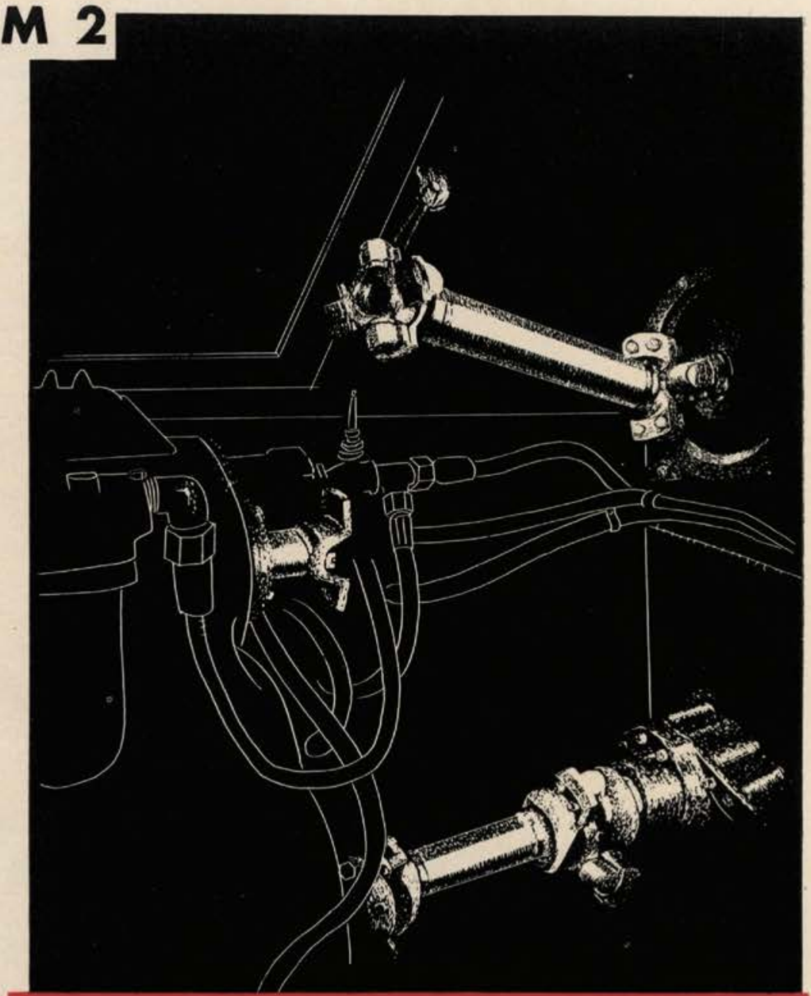
CAUTION: Connect tow cables only to the tow hooks, never to the towing pintle. Connecting them to the towing pintle will damage either the cable, the pintle, or both.

If evacuation is to be accomplished by the M74, using the rigid tow bar, steer brakes in the towed M59 will not be used, and there is no restriction as to the distance the vehicle may be towed. Shift lever must be in "neutral," and towing speeds should not exceed 12 MPH.

If evacuation is to be accomplished by a tank, using tow cables, considerable steering and braking of the towed vehicle will be required. Propeller shafts between the right-angle drive and the input side of the differential on both sides of the vehicle should be disconnected (disconnect at input flange of differential) and tied up or removed (see figure), and the shift lever should be placed in "low drive" range. This will operate the differential pump, providing oil under pressure to the differential components. As long as the differential does not overheat, there is no restriction on the distance the vehicle may be towed under these conditions. Speeds should not exceed 12 MPH.

In both instances, the master switch should be placed in the "on" position and the instrument panel warning light observed for signs of overheating. This will prevent needlessly damaging the differential.

In case the M59 to be towed had a damaged differential, the propeller shafts between the output side of the differential and the final drive on both sides of the vehicle should be disconnected. The towed vehicle would not have steering or braking ability in this instance; it will be necessary to use a rigid tow bar for control.



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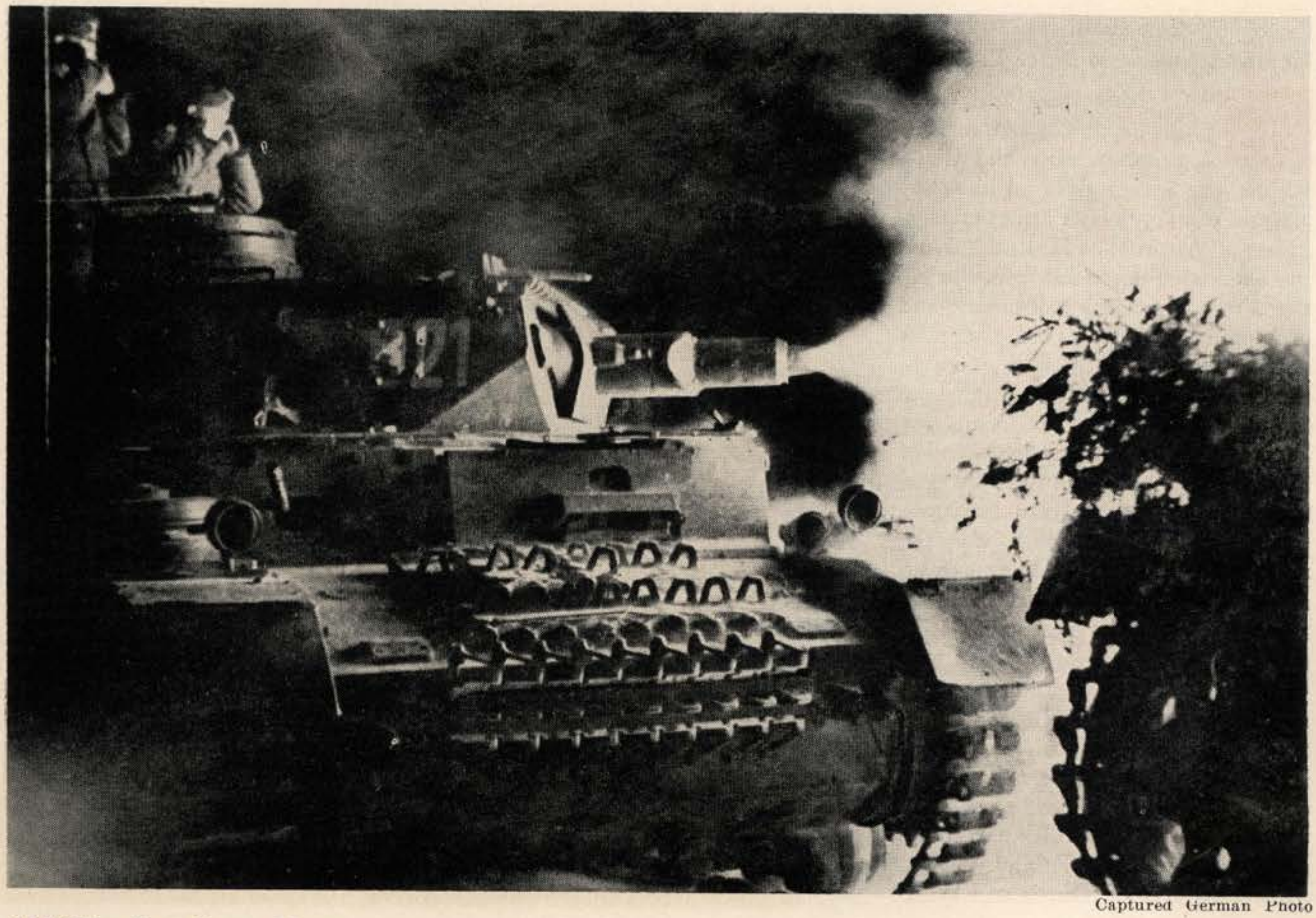
PANZER BATTLES

A Study of the Employment of Armor in the Second World War



Captured German Photo

U. S. Army

THE REVIEWER

Lieutenant General Bruce C. Clarke served in Europe during World War II initially with the 4th later the 7th Armored Division. After the War he served in various capacities in Army Ground Forces and as Assistant Commandant of The Armored School. After a tour in Europe he returned Stateside to organize the 1st Armored Division. He commanded a Corps in Korea and USARPAC prior to his assignment as Commanding General Seventh Army.

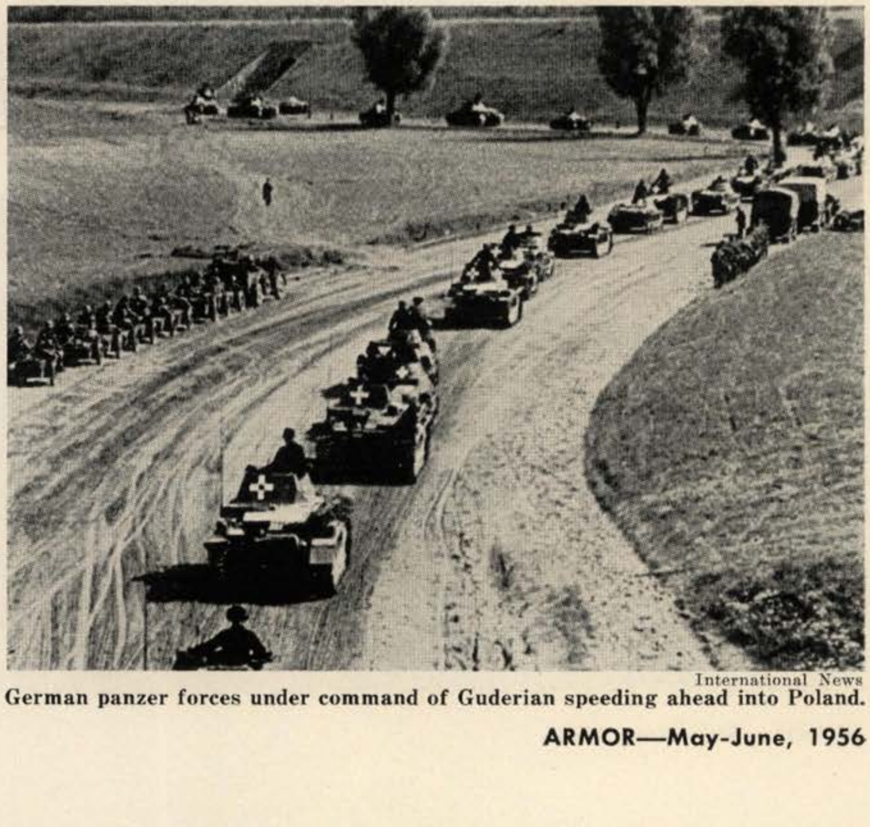
PANZER BATTLES. A Study of the Employment of Armor in the Second World War. By F. W. von Mellenthin. Translated by H. Betzler. Edited by L. C. F. Turner. 384 pp. University of Oklahoma Press, Norman, Oklahoma. $5.00.

Reviewed by
Lieutenant General Bruce C. Clarke

IN 23 interesting and easily read chapters, which include appropriate maps and photographs, the author gives an objective account of many major armor engagements of World War II. In the main, the battles are described from the author's viewpoint as a staff officer; and in keeping with the trend of similar books written by German generals, the German Army is given high honor, while mistakes and defeats are charged to political leadership. For these reasons, the book must be read with certain reservations; however, there is much food for thought by the military student, for the lessons in armored warfare are as current today as they were during the period 1939 to 1945.

Despite the fact that the author never had the responsibilities and decisions of command, he is well qualified to write on the subject of armored warfare. During his close association with many capable German commanders, he served in Poland, France, the Balkans, Africa, Russia and Western Europe. He was able to observe the tactics, equipment and personnel of all allied nations in battles fought over all types of terrain and under both climatic extremes.

General Von Mellenthin, a native of Breslau, is the son of a lieutenant colonel of Artillery. After serving as an enlisted man in the Seventh Cavalry Regiment, he was commissioned in 1928 and entered World War II as a captain of the General Staff. When Poland was invaded, Von Mellenthin was an Intelligence Officer on the staff of the III Corps. He served in the same capacity during the invasion of France and with Second Army in the Balkans. In North Africa he was an operations officer on Rommel's staff. Later he was transferred to the Eastern Front and served as Chief of Staff of the XLVIII Panzer Corps and the Fourth Panzer Army; and as Chief of Staff of Army Group G and Fifth Panzer Army on the Western Front. Von Mellenthin's military career ended on 3 May 1945 with his capture by American troops at Hoxter


International News
German panzer forces under command of Guderian speeding ahead into Poland.

THE AUTHOR

Major General F. W. von Mellenthin enlisted in the German Army in 1923 at the age of 19. He received his commission in 1928 and entered World War II as a Captain. Practically all his combat service was in a staff capacity. He was captured by American troops in the Ruhr in May 1945, at which time he was the Chief of Staff of the Fifth Panzer Army. He is presently living with his family in the Union of South Africa where he directs an African airline.

Black Star

Wesel in the latter stages of the War.

The invasion of Poland is treated lightly because ". . . German superiority was so marked that the operations have no special interest for the student of strategy and tactics." The impressive size of the Polish Army existed only on paper. The units which could be mobilized were poorly equipped and, lacking antiaircraft artillery, their movement was seriously restricted by German air attacks. Added to these deficiencies, the Polish Command attempted to deploy the forces available on an 800-mile front, thus dispersing and splitting them. Guderian's success with Army Group North is attributed to his handling of two panzer divisions and two light divisions as a single entity. "He realized that if armored formations are tied too closely to infantry armies or infantry corps, their main asset—mobility—cannot be properly exploited." Less success was achieved in Army Group South "where Armor was split up and dispersed among the various armies and corps."

International News

German tanks en route to the front lines in France pass marching troops.

The description of the invasion of France follows that of Guderian and Rommel but in less detail, for the author fought only in Lorraine as Chief of Staff of the 97th Infantry Division, a portion of which attacked the Maginot Line. In commenting on the Maginot Line, the author states: "In modern war it is in any case unsound to rely on static defense. . . ." Later battles in nearly every theater proved the fallacy of rigid or static defenses and the importance of the mobile and elastic defense.

The rapid collapse of France is attributed to the employment of armor in mass closely supported by motorized infantry, artillery and air; surprise; superior communications at all levels; and front line leadership. Although superior in numbers of men and tanks, the French failed to concentrate their forces and committed them piecemeal with disastrous results.

In describing the campaign in Greece, the author states that by 16 April 1941, it became clear that Axis success was assured, and that the British would form a bridgehead at Thermopylae and endeavor to embark their troops. In the action which follows, German success is attributed to separating the infantry from its transport and sending the troops on a wide flanking move through extremely difficult mountain terrain. Perseverance in pushing tanks one by one over "non-tankable" terrain and the subsequent surprise thus achieved was an-

European

In a panzer attack, antiaircraft artillery was trained to cooperate with tanks and played an important role in defense.

other one of its contributing factors.

General Von Mellenthin arrived in Africa in June 1941 shortly after Rommel's initial success in Cyrenaica during which Tobruk remained unconquered. There follow descriptions of the famous battles of "Crusader" and Gazala, and the German advance through Tobruk to Alamein in which the general conditions of desert war are treated. These descriptions closely parallel those contained in "The Rommel Papers" and provide an interesting supplement. The author's experiences in Africa end with unsuccessful German attempts to penetrate British defenses at Alamein. At that time he was evacuated to Germany because of illness. Von Mellenthin's description of the campaign in North Africa begins with his impressions of Rommel as a commander. Mildly critical in some respects, the end product is a man held in high regard by friend and foe, about whom Winston Churchill states—"a very daring and skillful opponent . . . and . . . a great general."

Except for the author's comments, the accounts of the various battles in the Western Desert contain very little that has not been covered in similar books dealing with that phase of the war. The successes of the Afrika Korps are attributed to "the superior quality of our (German) antitank guns, our systematic practice of the principle of Cooperation-of-Arms, and —last but not least—our tactical methods." In elaboration of the latter, the author states that while the Germans employed the 88mm gun to shoot tanks as well as airplanes, the British restricted their 3.7mm antiaircraft gun to an antiaircraft role. The 88's were used offensively as well as defensively in the ground role, as was the high-velocity 50mm antitank gun. Both weapons habitually accompanied tanks into action. In a Panzer division attack, artillery was trained to cooperate with the tanks and played an important role in defense.

Numerous German defeats in the Western Desert are attributed to failures in the supply system, the disruption of which was caused by the Royal Air Force based in Malta and the Royal Navy operating in the Mediterranean. Frequently reference is made to the superiority of Allied men and equipment over the Axis forces. British failures, according to the author, were the results of lack of control, inflexibility of plan and piecemeal armor attacks.

Of particular interest to the student of armor tactics are the battles of Sidi Rezegh, Gazala and the reduction of Tobruk. Tobruk was unique in that tanks were used effectively in the attack of a fortress, and the principle of close cooperation of all arms was outstandingly exemplified.

By the time Von Mellenthin reached the Eastern Front in November 1942, the Russians had begun their march to the West. He begins this portion of the book with an "Introduction to Russia" which, together with subsequent chapters on this phase of the war, is a must for the military student.

In a brief account of the German advance into Russia he quotes from Liddell Hart's "The Other Side of the Hill:"

> If the Soviet Regime had given her (Russia) a road system comparable to that of Western countries, she would probably have been over-run in quick time. . . . The Germans lost the chance of victory because they based their mobility on wheels instead of tracks. On these mud-roads the wheeled transport was bogged when tanks could move on. . . .

The prominent role of air support is again emphasized, but the author points out that "on the vast plains of Russia tank armies were the main instruments of victory." The author's comments on close and continuous tactical air support in armored warfare are worthy of separate treatment.

"In the Western Campaigns of 1940 and 1944-45 air power had a great effect on the armored battle." The Germans dreaded the Allied tactical air superiority—particularly in fighter bombers. The author states that in September 1944 "it was clear that American air power put our panzers at a hopeless disadvantage, and that the normal principles of armored warfare did not apply in this theater." He further comments that the Ardennes battle drove home the lesson "that a large-scale offensive by massed armor has no hope of success against an enemy who enjoys supreme command of the air." In Russia, on the other hand, the extremely wide fronts of 1941-42 and the "relative weakness of the Air Force engaged, limited the effects of air power. In fact, the Russian campaigns show that the more tank forces that can be supported and supplied by air, the more extended will be the mobility of their armored units and the better their chances of success." The air resupply role of supporting air forces is particularly important in view of the vast logistical support needed in armored warfare.

In dealing with the campaigns in the East, Von Mellenthin has interjected interesting observations concerning the Soviet soldier, his army and tactics. Of significant importance is their ability to infiltrate as individuals and as units complete with equipment and ammunition. The individual Soviet soldier, according to the author, "is essentially a primitive being, innately courageous, and dominated by certain emotions and instincts." One feature is his utter contempt for life or death, and with the same indifference he endures cold, heat, hunger and thirst. His moods alternate between cruelty and kindness. On the other side of the ledger, the author claims that the individual soldier is susceptible to panic when faced by surprise and unforeseen situations. This is a most vulnerable point.

Soviet tactics of mass attacks on narrow fronts without regard for casualties, their employment of tanks and artillery, and the Soviet supply systems are interestingly presented. They add little that is not already published; but these presentations are important background for any study of the Soviet-Axis campaigns.

In discussing the withdrawal, Von Mellenthin stresses two important problems which are frequently overlooked or not considered carefully enough. The first is that in modern war there is no such thing as a purely military withdrawal. The civilian population must be considered in detail in any plans for retrograde movement. Engineer support, supply points and traffic control systems must be established to insure that civilians do not interfere with the phasing and implementation of the military withdrawal. Second, on military withdrawals there must be a number of senior officers at critical traffic control points. As the author states, "the military police NCO is unable to wield enough authority in withdrawals" . . . particularly those which border on retreat.

The author returned to the Western Front in late September 1944. His treatment of the war in the West is in less detail than that on other fronts, and is considered to be of little value to the student who has access to more thorough information. After the capture of the Remagen Bridge by the U. S. 9th Armored Division, Von Mellenthin (then Chief of Staff of Army Group G) was one of the senior officers relieved when Hitler sought "scapegoats who could be made responsible for the blunders of the Supreme Command."

The over-all value of "Panzer Battles" to the military student is limited to its supplementing such books as "Panzer Leader," "The Rommel Papers," "The Other Side of the Hill," and "German Generals Talk." The material is clearly presented, but a separate map annex would facilitate the following of the detailed employment and actions of various units mentioned.

In conclusion, the book should be examined with this question in mind: How do these lessons and principles of armored warfare of World War II apply today? The development of atomic weapons and other instruments of mass destruction dictate that the military commander be prepared to conduct operations on both the conventional and the atomic battlefield. The very nature of armored units, tactics and thinking readily adapts itself to both types of warfare. Regardless of the type of war to be fought, the characteristics of mobility, flexibility, shock effect and unit integrity inherent to Armor will require armored formations, closely supported and supplied by air, to play a major role in any war of the future.

European

On the vast plains of Russia tank armies were the main instruments of victory.

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by

Richard M. Leighton and Robert W. Coakley

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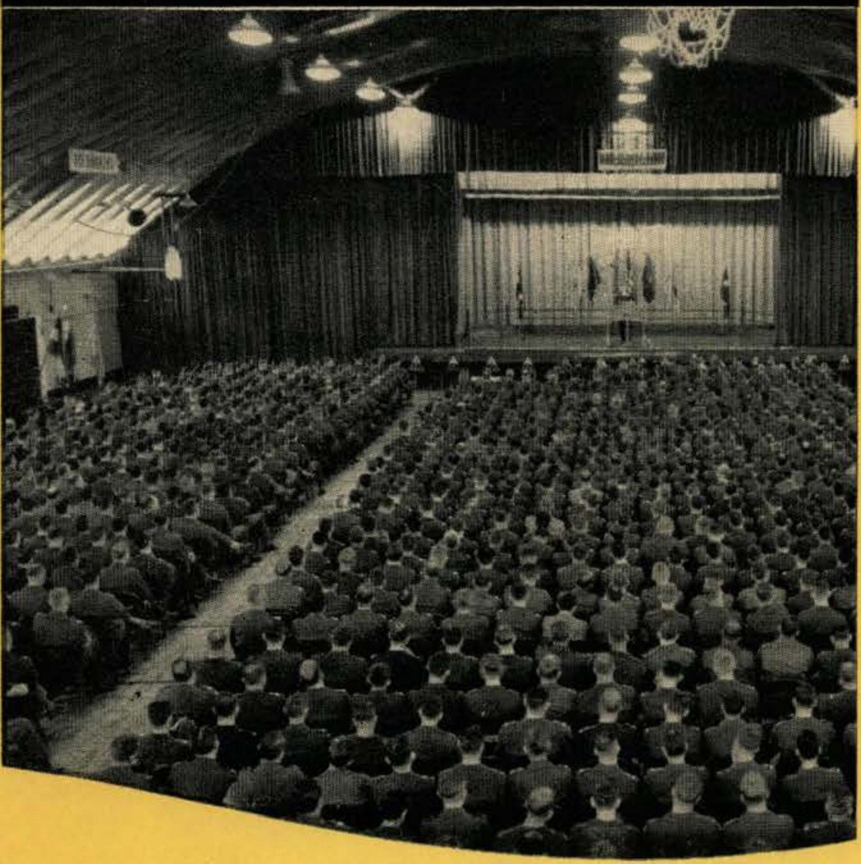
IN November 1885, a small group of cavalry officers got together to start the first of the combat arms associations. Our branch was quite small then and its members were scattered around the country. However, a home base was set up at the Service School at Fort Leavenworth, Kansas.

The practice in the early meeting years was for the members to assemble and read original papers on various military subjects, which were then taken under discussion by the membership. Distribution of this material resulted in the publication of the first journal to serve as the medium to reach all members. *The Journal of the United States Cavalry Association* was launched in March 1888.

This past November marked the 70th year of the Association's existence. During this time it has successfully covered the transition of the branch from Cavalry to Armor while continuing to promote the professional improvement of its membership; and preserving and fostering the spirit, the traditions and solidarity of Cavalry and now Armor in the United States Army.

The journal also made the transition from the saddle and stirrup to the turret and track without difficulty. The journal is now known as . . .

A RECENT MEETING OF THE MEMBERSHIP



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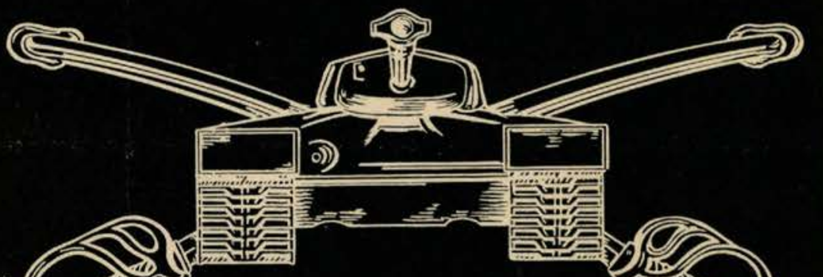

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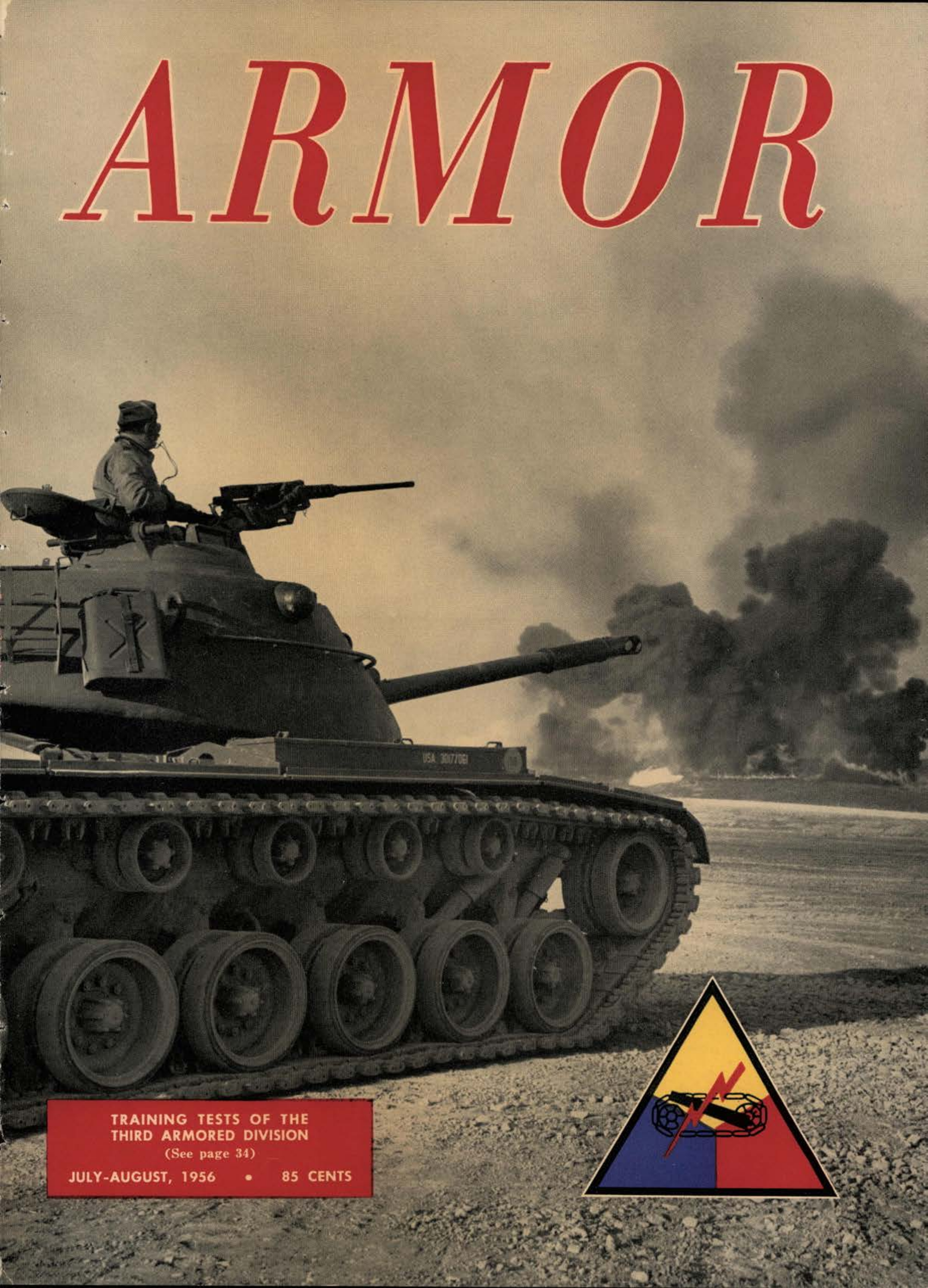

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(See page 34)

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TO BE REVIEWED IN THE SEPTEMBER-OCTOBER ISSUE

by

Brigadier General Harry H. Semmes, USAR

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ARMOR

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PANZER BATTLES

by

F. W. von Mellenthin

This is a candid and forthright discussion of World War II in general that reflects the author's familiarity with Anglo-American views of the war in Europe. Von Mellenthin evaluates the nature and disposition of the Russian soldier, his method of fighting, his capacities, and his weaknesses. It is a military work of excellence. A must for every student of military strategy, it also provides exciting and informative reading for the layman.

$5.00

LETTERS TO THE EDITOR

ROTC Awards

Dear Sir:

The May-June issue of *ARMOR* carried an article concerning the "Outstanding Senior 1956 ROTC Cadets—Armor." This article, and the award which you grant, seems unduly restrictive in its scope. That is, only those cadets graduating from Armor Branch Material ROTC courses are considered.

I do not propose to enter into the argument of "Branch General ROTC" vs "Branch Material—Armor ROTC" for two reasons: first, because I am not qualified to present adequately either side; secondly, it seems that the "die is cast" and our purpose should be to make the most of the existing situation while working for improvement rather than to attempt to recall the past.

As you know, Branch General ROTC units are turning out a considerable number of Second Lieutenants of Armor. From the tenor of the article, and also from the fact that they are not eligible for your association award, I am sure that these graduates are beginning to wonder if they really belong.

The article seems to indicate that the color of a man's "Old School Tie" is more important than his basic qualifications as a man. I am sure that you do not agree with this. History, past and present, clearly indicates that it is not true. I am sure you agree that an individual with the capability and personality to properly employ the mobile arm will most probably stand out in Armor in a few short years regardless of his basic branch beginning.

I am presently on ROTC duty at Indiana University which has Branch General ROTC. This year we will commission 43 Second Lieutenants of Armor; 23 of these will put in six months active duty for training and 20 have received the 24 months tour. Included in those selecting and receiving reserve commissions in Armor are the two top cadets (Corps and Regimental Commander) and one of the three Battalion Commanders. Two of these three applied for, and have tentatively received, Regular Army Commissions. The Armored instructors here are proud of this interest and would like to see it continue as we believe that this is one of the better ways to insure an active, aggressive and capable commissioned officers corps in Armor.

With this in mind, and with due consideration for the fact that those receiving their commissions from ROTC must attend the Armored Basic Officers Course at Fort Knox, I would like to suggest that the U. S. Armor Association award be broadened as follows:

1. Include, as eligible, all ROTC cadets to be commissioned in Armor.
2. Select the top ten to fifteen cadets for receipt of the Armor Association Award.
3. Selection to be based on a combination of factors such as:
    (A) Cadet standing and leadership ability.
    (B) Academic achievement, academic major considered.
    (C) Extracurricular activities.
    (D) Summer camp rating (possibly).

I hope that I am not being presumptuous in making this recommendation. It is not presented with any idea of criticism but with an idea that it may assist, in a small way, the U. S. Armor Association to continue to recognize and reward ability regardless of its source

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Rates: See bottom of contents page.

and to also encourage capable young men to choose for their active and reserve military career—Armor—the combat arm of decision.

Major John D. Sharp, Jr.
420 S. Mitchell Street
Bloomington, Indiana

- *The writer of this letter has some most interesting and constructive recommendations. When these ROTC awards were originally established it was with the express purpose of enhancing Armor at the various installations having a course of Armor instruction. As many of us are aware the Branch General course is closing in. We still maintain that some recognition should be made at these installations retaining Armor instruction. However, we intend to inquire into the feasibility of selecting the top graduates choosing Armor as their basic branch and, upon their being selected for Regular Army commissions in the mobile branch, give them due recognition. Any suggestions from other members who are stationed at ROTC installations will be greatly appreciated.*

This past year several ROTC installations that are teaching Branch General subjects asked for an appropriate award for the top graduate going Armor. The least we could do was to award a one-year honorary membership in the Association and we were happy to be able to do this. Ed.

Lesson Plans

Dear Sir:

After spending several hundred hours writing lesson plans for various phases of Armor training, it seems as if some type of Central Lesson Plan Agency could be instigated. Fort Knox, being the Armor Center, has both the facilities and personnel for producing all Armor lesson plans, most of which are, at the present time, in use there.

Why are thousands of hours wasted by various Armor units throughout the world in the duplication of effort regarding lesson plans, when it is possible for the Armor Center to produce and distribute these lesson plans to all Armor units. Not only would this save many man-hours, but would provide for more uniform Armor training, in turn producing better trained personnel and more efficient units.

Lieutenant Larry L. Parks
Co. A, 759th Tank Bn.
Ft. Ord, California

- *Something has gone wrong or somebody did not get the word. Unless memory fails completely The Armor School has been doing this for years. Anyway, it is strongly recommended that anybody needing lesson plans contact the Non-resident Instructional Department, TAS, Fort Knox, Kentucky.* Ed.

Unit Pride, Incentive Awards, etc.

Dear Sir:

I am a member of the Armor Association and noticed in the magazine a while back that an Armored unit had given a Best Soldier award of a membership to the Armor Association at summer camp. I am a platoon leader in the Tank Company, 406th Infantry Regiment, 102d Division. The other officers and I have decided to give a "Crack Tanker" award at camp. I would like to know if it would be possible to get the membership card before camp time so it could be presented to the winner at a formation at camp. We could then send in his name and address in order that he will receive the magazine.

We are quite proud of our Company. Our strength is 75 enlisted men and six officers. We hope to have it up to 108 enlisted men by summer camp so we will have a lot of competition for the award.

Lieutenant Oda C. Miller
11689 E. 45th Terrace
Kansas City, Mo.

- *The award has been set up and we hope that many other units will consider Associate membership in the Armor Association a worthy prize for a job well done.* Ed.

THE COVER

The U. S. Army photo on the cover was taken at Fort Knox during the CS 1 demonstration which was ably presented by The Armor School, School Troops and TAC Air, for the Secretary of the Army at the Annual Meeting of the Armor Association. In attendance were many members of the 3d Armored Division, since departed for Germany to add to the mobility of the Seventh Army.

PANZER LEADER

by

Heinz Guderian

The memoirs of Germany's great panzer leader and mobile warfare's great executor constitute one of the top books to come out of history's greatest war, and as a solid piece of history of mobile warfare and its contemporary tool, the tank, are required reading for members of the mobile arm. The book comprises a real background of doctrine, organization, tactics, techniques, equipment, history and leadership in mobility in war.

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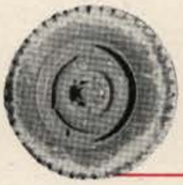
Have we given lightweight wheeled vehicles a fair test?
Will they provide us with the required degree of mobility?

WHEELS FOR ARMOR

By

RICHARD M. OGORKIEWICZ



FIVE years ago, on these pages, the present writer reviewed the history and development of wheeled armored vehicles and their future possibilities.[1] At the time interest in the subject was limited, although it was known that one or two countries were continuing the development of wheeled combat vehicles and, as was pointed out, there were several roles which these vehicles could most usefully perform.

Since then the position has not basically altered, in the U. S. Army at any rate. However, information on a number of new wheeled armored vehicles, which could only be hinted at when the above article was written, has been released and several significant developments have appeared in the general field of off-the-road wheeled vehicles. There have also been some positive signs of a trend to lighter weight combat vehicles, as shown, for instance, by the adoption of the "Ontos"[2] and the 90mm self-propelled antitank gun T101.[3] This trend favors the development of wheeled armored vehicles for it is in the light weight category that they are most competitive.

There is, therefore, more than one reason for taking another look at the situation and, as should become apparent, ground for asking whether the continued neglect of wheeled armored vehicles is really justified and right.

Wheels or Tracks?

Much of the recent lack of interest in wheeled armored vehicles is due to the indifferent performance of wheeled military transport in the past. As a result considerable emphasis has been placed since World War II on the development of tracked cross-country vehicles for the various elements of armored formations. Many articles in *ARMOR* and the new armored personnel and cargo carriers provide clear evidence of this.

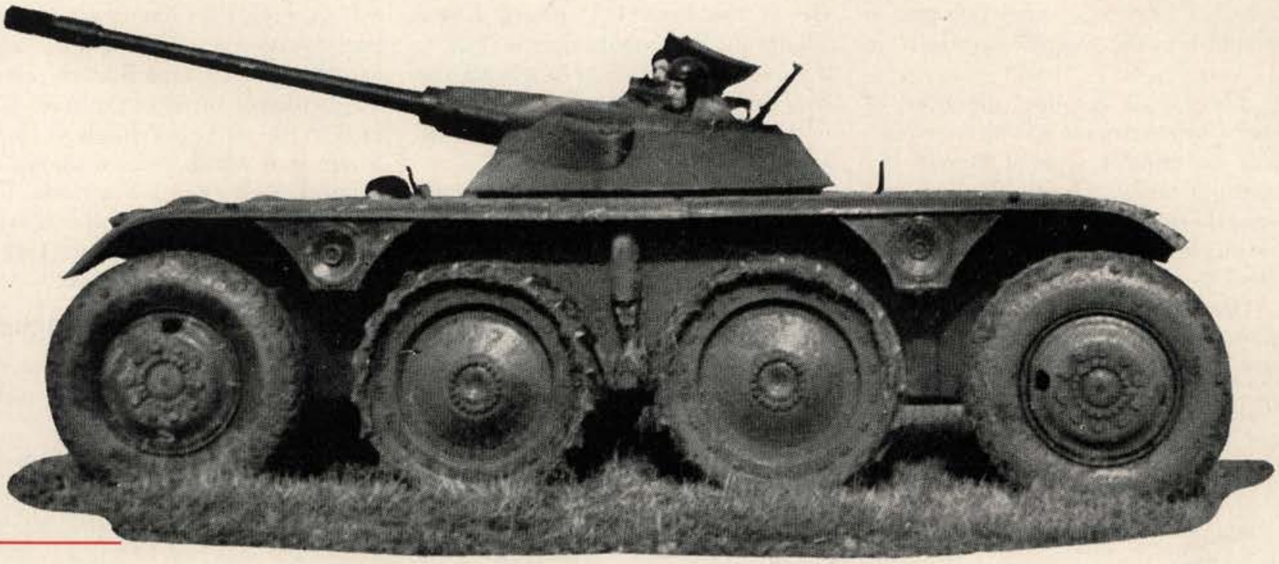
Without any doubt all the emphasis on the cross-country mobility of armored units has been and is right.

Daimler Co.

Daimler armored cars have been used by reconnaissance units of British Army.

RICHARD M. OGORKIEWICZ, a frequent contributor to the pages of *ARMOR* Magazine is employed as Development Engineer, Humber Ltd., Rootes (Automotive) Group, England.

The French Panhard reconnaissance car with two sets of retractable center wheels.



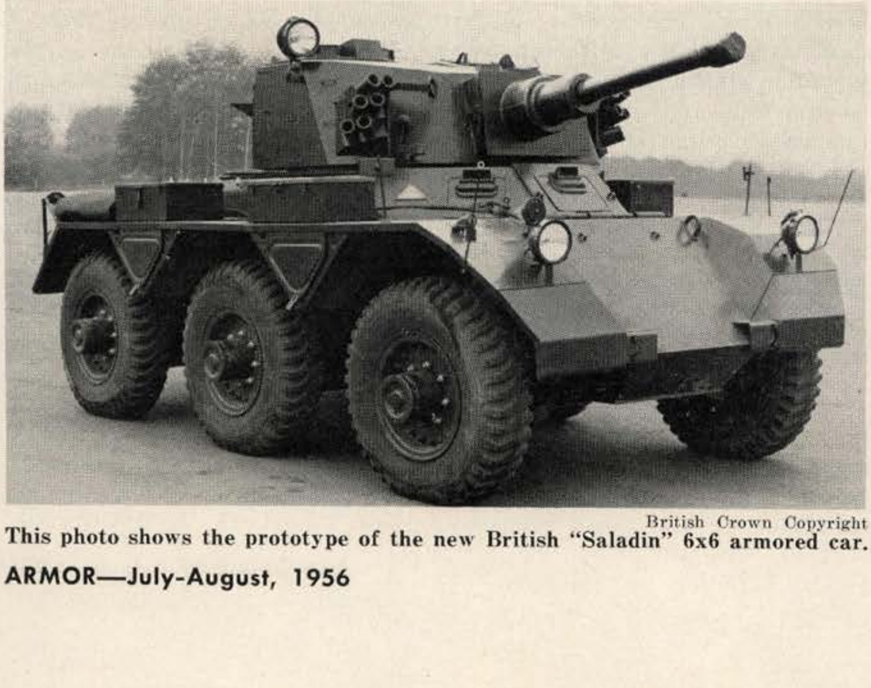
Wide World

But how this cross-country mobility is achieved is an entirely separate issue. The real point is that cross-country mobility should be achieved. Whether it is achieved by means of tracked vehicles, or wheeled vehicles, or any other form of transportation is of secondary importance to the main argument. And to assume automatically that wheeled vehicles are out is wrong!

Not only is it unjustified to assume, as so many do, that wheeled vehicles are incapable of further development, but unbiased examination of the relative performance of wheeled and tracked vehicles shows that the former, when properly designed for cross-country operation, are not only as good but often even better than tracked vehicles.

A striking example was given in the article by Dr. F. M. v. Senger, a former German armored force officer, describing operations of armored formations in muddy terrain—which are about the worst conditions for wheeled vehicles.[4] It showed that even under the most difficult conditions on the Eastern Front, in Russia, German eight wheeled armored cars were able to maintain a high degree of mobility—higher than that of many tanks!

Good as it was, the German 8x8 armored car was not, even then, the last word in multi-wheel cross-country vehicle design. Several much more advanced designs, such as the French eight wheeled *E.B.R.*, have been developed since and have demonstrated their cross-country potentialities. The *E.B.R.* for one has proved itself every bit as good as the latest medium tanks as far as muddy terrain is concerned. Under more favorable conditions, such as dry rolling country or in the deserts, there is just no question which type has the greater mobility!



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This photo shows the prototype of the new British "Saladin" 6x6 armored car.

New British and French Vehicles

In recognizing the potentialities of wheeled armored vehicles one must not, of course, ignore their limitations which are no less real than those of

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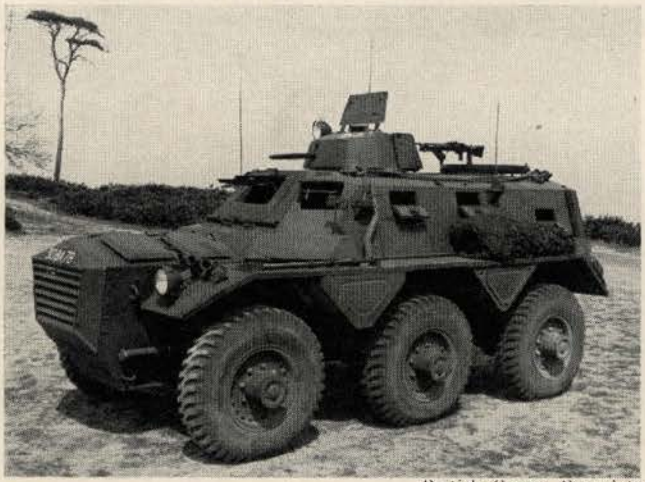
tracked vehicles. The limitations are largely those of size. At the moment, in the present state of the automotive engineering art, the advantages of wheeled armored vehicles begin to diminish as the weight exceeds 10 to 12 tons.

There is no question, therefore, of the wheeled armored vehicles replacing the current type of 40-odd ton medium tanks. There are, however, several other excellent applications for them, shown by the developments in other countries.

One good example is the British *Ferret* scout car. This excellent little 4x4 armored car is a further development of the Daimler scout cars of World War II, which have more than proved themselves over the past seventeen years in a wide variety of reconnaissance, liaison and security roles.



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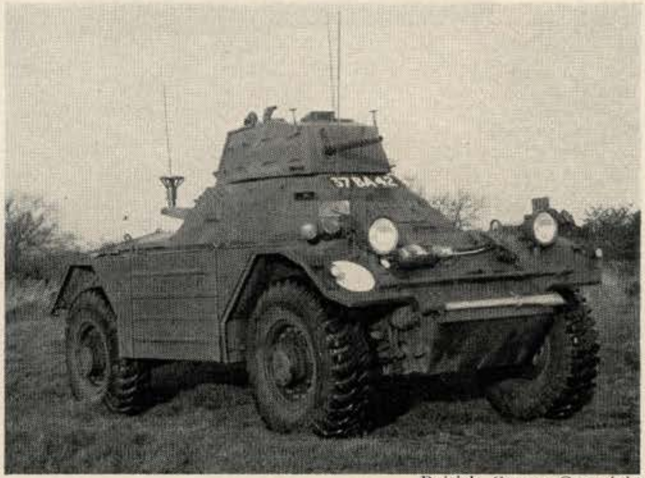
A British Alvis "Saracen" 6x6 personnel carrier. It is used as a command vehicle, ambulance and Saladin armored car.



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The "Ferret" 4x4 scout car which is currently replacing the earlier Daimler cars in British reconnaissance units.

Another British example is the new Alvis *Saracen*. This 6x6 vehicle is built as an armored personnel carrier capable of carrying 12 men, as a command vehicle, and as an armored ambulance, and its chassis is also used for the *Saladin* 6x6 armored car. The latter is coming to replace the earlier 4x4 Daimler armored cars which have been the mainstay of the reconnaissance units of British armored divisions since about 1942. Like the Daimler armored cars, which in turn were evolved from the B.S.A.-Daimler scout cars, the *Saladin* has that very desirable feature of a single central differential and, of course, independent suspension all round.

An even more striking post-war development in wheeled armored vehicles is the French Panhard *Engin Blindé de Reconnaissance,* or *E.B.R.* This is an 8x8 vehicle but with the four center wheels, which are fitted with heavy steel grousers, retractable for normal road operation.

The idea of retractable powered center wheels was first successfully demonstrated in the mid-thirties on the six wheeled Gendron-Poniatowski armored car, subsequently renamed Gendron-Somua after the Société d'Outillage Mécanique et d'Usinage d'Artillerie, or S.O.M.U.A., which built the prototype and several other excellent armored vehicles for the French Army.[5] The prototype of the Gendron-Somua was unfortunately submitted after a decision had been taken to standardize on a competitive Renault reconnaissance vehicle design, and as a result, although superior to the latter, it was never adopted.

After World War II, however, the idea was taken up again. Both six and eight wheeled designs were considered and the latter was finally adopted for the armored reconnaissance car which became the *E.B.R.* The standard model is a 28,500 lb vehicle and has a crew of four, including two drivers, which enables it to be driven equally fast in either direction, the maximum speed on roads being no less than sixty miles per hour.

The virtues of the *E.B.R.* are not, however, confined to high speed, excellent cross-country performance and a large radius of action. One of the latest versions, designated the *chasseur de chars,* or "tank hunter," carries the oscillating turret of the *A.M.X. 13* tank with its super high velocity 75mm gun which gives it almost the firepower of a medium tank. This proves, if proof be needed, that wheeled armored vehicles need not always be inadequately armed!

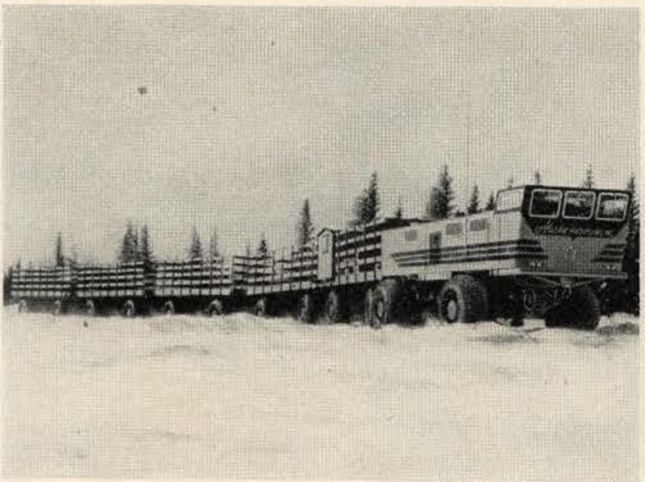
Developments in the United States

In view of what has been accomplished elsewhere, it is most unfortunate that the United States has given so little attention to the development of wheeled armored vehicles.

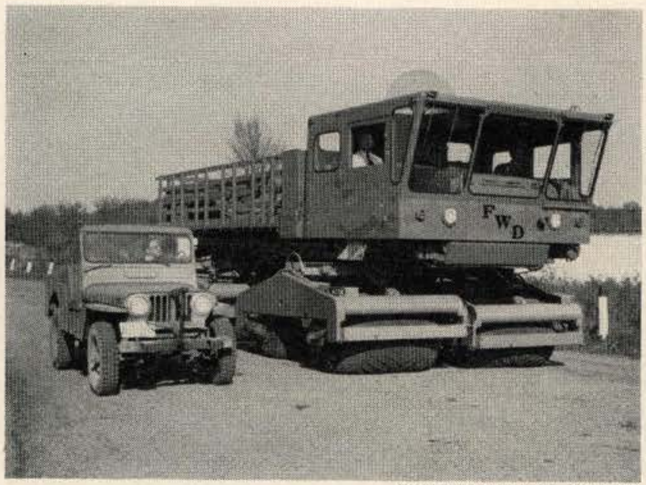
Since the gradual decline of the M8 armored car no other wheeled armored vehicle has been brought into service, though countless new tracked vehicles have been introduced. Yet unarmored wheeled vehicles continue in service, side by side with tracked vehicles, and are certain to continue to do so. Is it logical, therefore, to debar wheeled armored vehicles from further service?

Least of all is the present policy logical if it is based on the performance of the M8, the only wheeled armored vehicle used in quantity by the U. S. Army in recent years. In case it is forgotten, the M8 was conceived in 1941 as the 37mm Gun Motor Carriage T22—a light antitank vehicle capable of being mass produced at minimum cost. It is hardly surprising, therefore, that its performance was not quite what some might later have wished—for it was never designed to give the ultimate in cross-country performance. There was at least one more promising model by the end of World War II—the 6x6 M38—but shortly after the war the whole development was abandoned.

But though the military powers that be showed no interest in wheeled armored vehicles, the development of wheeled cross-country vehicles in the United States has not remained static.


R. G. LeTourneau Inc.

A LeTourneau "Sno-Freighter" transportation train in Alaska. Every wheel is driven by a separate electric motor.


Four Wheel Drive Auto Co.

The "Teracruzer" shown here rides on "Rolligon" tire bags which enable it to be driven over all types of terrain.

Several new types of vehicles have been successfully developed and some have already been illustrated in *ARMOR*.

There is, for instance, the *Teracruzer* built by the Four Wheel Drive Auto Company, of Clintonville, Wisconsin, in cooperation with the Army Ordnance Detroit Arsenal. This experimental cargo and personnel carrier is a development of the *Rolligon*[6] idea and as such rides on eight tire bags developed especially by the Goodyear Tire and Rubber Company, which enable it to traverse many types of terrain impassable to more conventional vehicles.

Whether the wide small-diameter tire bag will find wider application remains to be seen for this type suffers from a fundamental disadvantage as regards traction efficiency and on theoretical and practical grounds is inferior to a large diameter narrow tire of comparable ground pressure.

As regards large diameter wheeled vehicles, several very interesting models have been built by the R. G. LeTourneau, Inc., of Longview, Texas, an organization with long experience of off-the-road equipment. They include the *Sno-Freighter*, specially designed for work in Alaska's frozen wastes, a large six wheeled bulldozer, a wheeled landing craft retriever and a transporter for the Corporal missile. The *Sno-Freighter* is particularly interesting, for a transportation train of this type, consisting of a power plant car and five cargo cars, has a load capacity of about 150 tons and could well form the basis of mobile bases for future armored operations.

A compromise between the characteristics of the large diameter narrow tire and the small diameter wide tire-bag has been offered on the experimental *Rhino* vehicle invented by E. P. Aghnides and built by the Marmon-Herrington Company of Indianapolis, well known for its M22 airborne light tank of World War II. The hemispheroidal wheels of this remarkable vehicle offer progressively increasing contact area with sinkage on soft ground, without incurring the handicap of the large diameter tire or the drive and installation difficulties of the tire-bag. The shape of the wheels also greatly increases the stability of the vehicle and to top it all the *Rhino* is amphibious!

A somewhat similar approach to improved cross-country performance is that put forward by Nicholas Straussler, a Hungarian-born British engineer with a long association with armored vehicles, including the pre-war Alvis armored cars, and the inventor of the D.D. tank amphibious flotation device of Normandy fame. His *Lypsoid* tires can be used with conventional type vehicles and by their combination of increased contact area and compacting action achieve greatly improved performance over soft ground while still maintaining good performance over hard surfaces.

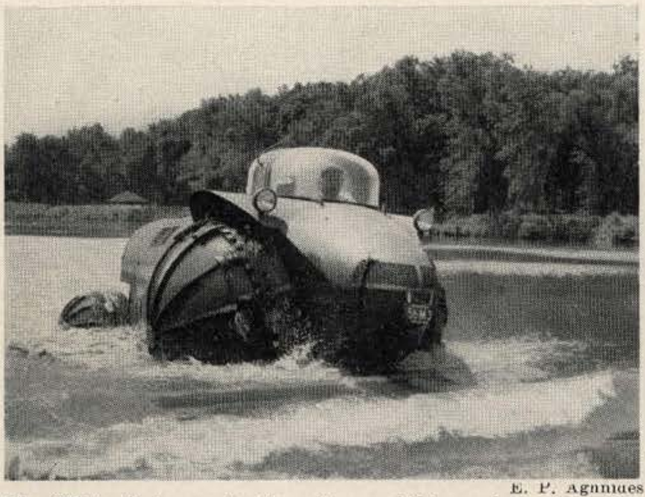
Hydrostatic Transmissions?

From the above it is evident that there are several possible lines of development towards still better cross-country performance of wheeled vehicles. There are also other developments which could contribute to still further design improvement.

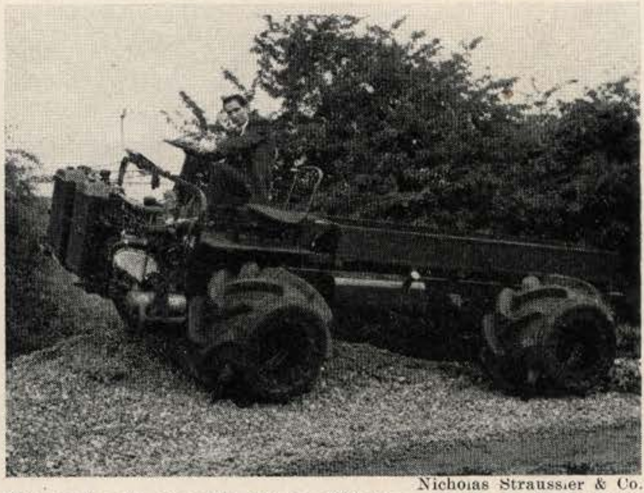
One is that of transmission, which is always a serious problem with the larger multi-wheel drive vehicles. The drive mechanism on vehicles such as the *E.B.R.* or the *Saracen*, for instance, is quite a complicated affair, with numerous half-shafts, universal joints, bevel boxes, constant velocity joints, hub reduction gears and so on.

The whole is remarkably trouble free and the results, in terms of performance, more than justify the complication. But nevertheless, something simpler would be highly desirable.

One possible solution offers itself in the form of the hydrostatic transmission. This type, not to be confused with the familiar hydro-kinetic torque converter, consists essentially of a positive displacement hydraulic pump directly coupled to the vehicle engine and a positive displacement hydraulic motor at each driven wheel, the connection between the pump and the motors being nothing more complicated than pipes carrying the hydraulic fluid.


E. P. Aghnides

The "Rhino" demonstrating its amphibious characteristics. On hard surfaces it can travel at approximately 45 m.p.h.


Nicholas Straussler & Co.

Straussler truck with "Lypsoid" tires which provide cross country performance comparable with tracked vehicles.

The principle of the hydrostatic transmission is not, of course, new but up till now its efficiency has been low. Intensive development has, however, greatly improved its performance and there has been a considerable increase of interest in it in many parts of the world. In England, for instance, the National Institute of Agricultural Engineering has developed a hydrostatic transmission tractor and in Germany an experimental bus and several locomotives using such transmissions have been in operation for some time.

There are also other avenues of approach which may prove equally fruitful. The LeTourneau vehicles, for instance, employ electrical transmissions with a generator coupled to the vehicle power unit and an electric motor at each driven wheel.

Light Armor on Wheels

But even if the existing types of wheeled armored vehicles are short of perfection, their potentialities are considerable. Some of their advantages have been listed already: they include high speeds over practically all types of terrain, greatly increased radius of action resulting from lower mechanical losses than those of tracked vehicles, reduced wear and tear and consequently lower maintenance and logistical support requirements. These features, coupled with their ability to carry sizeable armament and to provide a reasonable degree of armor protection, on vehicles of up to 10 or 15 tons, would make them invaluable to many armored outfits—superior on one hand to the armored tracked vehicles and on the other to the unarmored wheeled vehicles.

Wheeled armored vehicles would be particularly valuable to the reconnaissance battalions of armored divisions and armored cavalry regiments. General Gavin[7] and others have rightly pointed to the importance of the mobility differential for mobile armored units and the handicap of heavy and relatively slow equipment. The highly mobile roles which armored units are called upon to perform call for highly mobile equipment and there is no doubt that properly engineered wheeled armored vehicles could make a substantial contribution to the problem.

There is also the other aspect of the problem, namely the trend toward lighter armored equipment, mentioned earlier. If this trend continues, as it is likely to do with the increasing demands of air-transportability and the inter-continental mobility of Army units, then the application of wheeled armored vehicles is going to be much more general, well beyond the reconnaissance and light cavalry roles.

Coming back once more to the question of wheels *vs.* tracks, the requirement of armored combat vehicles has been always that of providing a maximum of mobility. If a light wheeled armored vehicle can provide it more efficiently than a corresponding tracked vehicle then it is high time that its development was taken up in all seriousness.

[1] Ogorkiewicz, Richard M., "Armored Cars: Their Past and Their Future," *ARMOR*, March-April, 1951.

[2] "The Ontos," *ARMOR*, September-October, 1955.

[3] "90mm Self-Propelled Airborne Gun," *ARMOR*, November-December, 1955.

[4] Senger, Dr. F. M. v., "March of an Armored Division During the Muddy Season," *ARMOR*, November-December, 1955.

[5] Ogorkiewicz, Richard M., "Armor in a Defeat," *ARMOR*, July-August, 1950.

[6] "The Rolligon: A Revolutionary Development in Roadless Transport," *ARMOR*, March-April, 1954.

[7] Gavin, Major General James M., "Cavalry, and I Don't Mean Horses," *ARMOR*, May-June, 1954.

from the 67th Annual Meeting . . .

The Forum on the Reserve Forces Act

As stated in the report of the Annual Meeting in the May-June issue, we intended to bring you the various forums in this issue. After a careful screening of the material, we highlighted the important aspects of each forum subject and they are presented here. The complete list of panel members was given in the previous issue of ARMOR. *Here are the names and assignments of the various members in order of appearance in the text: Brig. Gen. C. W. Abrams, Office of the Special Advisor for Reserve Components, D/A; Brig. Gen. P. F. Lindeman, Chief, Army Reserve and ROTC Affairs, D/A; Brig. Gen. S. L. Myers, CG, USATC, Armor.*

The Problem

General Abrams—The 1955 Reserve Forces Act continues the concept of a ready reserve and a standby reserve and it puts some teeth in it. It provides for additional means of positive personnel procurement. It means that every soldier who was enlisted or inducted after the passage of the act, upon completion of his two years of service with the active forces, has a remaining four years of military obligation in which he is required by law to participate for three years in a reserve unit, or if he is not geographically located near a reserve unit, he has to go to summer training. The remaining year of his obligation is in the standby reserve. It provides a new program which permits men to enlist in a reserve unit, take a period of six months active duty training and then continue by participating in the reserves for a period of seven and one-half years. It provides means to screen the ready reserves so that the distribution of skills and talents within the reserve components of the Army, and within the armed forces would be equitable, and that skills and talents between the military and industry would be equitable. It means that what would be in the ready reserve could actually be called to duty.

I want to emphasize first of all the ready aspects of the reserves. It is best described by Admiral Radford, who said in testimony before the Senate Armed Service Committee last year, "I am talking about a reserve numbering 2,900,000 trained men predominantly in organized units, ready to move into action at any moment from a D-Day call on up to full mobilization basis by six months. And when I speak of 2,900,000 ready reserves, I mean a force that is comprised of experienced leaders, men trained in the art of combat, and with the spread of technicians and skills that are an integral part of today's modern fighting force."

When this law was passed, our ready reserve consisted of about 500,000 officers and men in the Army. What is the ready reserve? First, it is the organized units of the National Guard. Next, it is the organized units of the Army Reserve; and finally, it is the active and participating personnel of the Army Reserve not assigned to organized units. Those three essential elements comprise the ready reserve. At the time of this act, we had about 500,000 in all those categories. The bulk of them were in the National Guard—about 350,000. Now, the figure of 2,900,000 set for the ready reserve is the total strength of the reserve components; the ready reserve of our armed forces, Army, Navy, Air, Marine Corps and Coast Guard. The Army's share of the statutory limit of 2,900,000 is 1,692,000.

Think of the differential there of 500,000 in the ready reserve at the time of the passage of this act and the eventual goal of 1,692,000, and you have the rough dimension of the problem that faces the Army to expand and build, organize and train the kind of ready reserve of which Admiral Radford spoke.

The Army Reserve

General Lindeman—I think that the situation confronting the Army Reserve at this time presents four major problems: strength, facilities, equipment and training. The organization that we have in being today is what we must build on and improve in the future. Now, as I see this program, we are gaining strength; thus, we are overcoming one of our major problems. As we increase in strength, we must improve our facilities to train this new personnel. We admit very freely that a program of construction of this magnitude involving all these new training centers requires time to complete. The lead time, in fact, is from 18 months to two years. Knowing this, we are taking maximum advantage of our present facilities in the hope that in time our building program will approach our strength buildup.

In this connection, I would like to point out that we have no justification for building a new training center until we actually have the personnel training in that particular area. We can plan, but we cannot build on "future" requirements.

Next equipment. Many economies were of necessity placed in effect in the past because of the declining strength of the Reserve. When the Reserve strength shrank during 1951-1953, we pooled equipment and endeavored to get the most possible use from it without spending a lot of money.

We have been criticized about our training in the Army Reserve. But this, too, depends on three factors. The more personnel we have to train, the better the quality of our training will be. When we have better facilities, we will have better training. As we get more equipment and a place to store the equipment, we will have better training.

So all four problems are interlocking and tied together. And the solution of all is dependent upon our increasing our strength.

Aptitude

General Myers—First perhaps, it would be well to have a few words about the nature of the trainees that are coming here. As far as their motivation is concerned, it appears to me that they have the highest enthusiasm of any group of young soldiers I have ever seen in my life. They are all anxious to learn. They do learn quickly and they seem to have their hearts set on doing the best job they possibly can.

As far as the educational characteristics are concerned, I don't believe they are quite as high as we anticipated they would be. I thought perhaps a preponderance of high school graduates would be included, but unfortunately it turns out that there are a number of them who are far from high school graduates.

Physically their standards have been about what you would expect from a high school age boy, not up to the standard initially of the regular army soldier, but with training and close supervision of that activity their physical standards develop rapidly. They, while they have been here, have matured tremendously in the physical field.

General Abrams—General Myers, on this educational level, we haven't yet run a full year course on this. Do you think that there is a possibility, after we have gone through one summer on this program, that the educational level might be raised?

General Myers—Yes, there is every evidence that it will because as we know now a great many of these men who have been deferred for entry until June or July are waiting to graduate from high school so they can come in the program. No doubt but that it will raise considerably.

General Abrams—Just what does the training program consist of and how are they, the trainees, doing in it; what is the product we are getting out of this six-month training program?

Training

General Myers—The program we have here involves primarily basic at first. The first few months we had nothing but basic to begin with. We gave them eight weeks of basic combat training, and I am sure you are all familar with this program. At the end of that, they are given a two-week leave and they are dispersed throughout the United States to take branch material training in the other centers that are so arranged to do it. Those who continue their training in Armor all come here from the other areas. At the end of their leave, they go into advance individual Armor training which is exactly the same ten-week program to make tankers that we use for the AUS personnel. At the end of that ten weeks, we have four weeks of concentrated tactical training and basic unit training, in which we instill in them the tactics of the section and the platoon. We also give them at least one combined arms problem to assure that they know something about the employment of more than one arm. They have done exceedingly well. Occasionally there is a misfit, but by and large I would say that 97 or 98% of all of them have been outstanding students. They are most enthusiastic and we are turning out a good product at the end of the course. I feel that they are as well trained soldiers as one could ask for. This last four weeks is very important. We put them in the field. Three of those four weeks they move right out on the reservation and camp out there. They are going all the time. By so doing we are able to condense in that four weeks a great portion of the whole eight weeks of advance unit training which you would encounter in the T/O&E organization.

In the specialist field, we have not had too many yet, but again the motivation is good. They are enthusiastic and they are making fine students. So far we have only had somewhere in the neighborhood of 115 in that field; in the general clerk, radio and mechanic schools. But again, in the specialist field they are turning out just as good as we find in the Regular Army. I might say on the subject of accomplishments in the training, every single one of these companies that have started here has established standards that are greater than we have known before in normal AUS companies taking similar training. For example, and I am prepared to beat off those who say there might be some irregularity in the scoring on this, every single company that has fired on the known distance rifle range has qualified better than 92% of the men, which is, I am sure for those who have worked in training centers before know, much higher than the average AUS personnel.

One company qualified 100% on the first go-round. I was so dubious that I had the scores checked and rechecked, and there were officers taking scores in the pits. So it has been done.

In the proficiency tests, very, very few failed, not over three men per company, which is rare, too. Three of the companies have made 100% on the proficiency tests at the end of eight weeks. In physical fitness, they have raised their scores an average of about 60 to 70 points per man across the board. So, my feeling is, and I think everyone in the command agrees, that we have a good product and we are turning out good products.

General Abrams—General Lindeman, could you give us some idea of the kinds of units and the types of units that there are in the Army Reserve?

Types of Reserve Units

General Lindeman—In the Army Reserve, the majority of the units are either combat or support type. We do have ten divisions that are combat. We do have Engineer Brigades. We do have Artillery Groups, but the majority of our troops are of the support nature. And I think that is the difference between the Guard and the Army Reserve. We have most of the support. We also furnish many units for the mobilization base, but in our Army Reserve it runs a gamut of combat down to technical services and administrative units. But our majority are of the support type.

General Abrams—There are two points I want to make. First, the National Guard is currently the biggest part of the ready reserve in the Army, and it is essentially all combat units. Secondly, the thing that is important is the tremendous spread of different kinds of units that are in the Army Reserve. That means a lot of specialists have to be trained. The specialist training that is carried on in General Myers' organization is going on in many other places; the technical services; at Camp Gordon they are training signalmen and military policemen, and some at Monmouth; at Fort Leonard Wood the engineers are being trained in a variety of MOS's as well as the basic engineer soldier. And the specialist training programs all over the Army in the appropriate centers are being carried out in this six-month program to really give us, in the end, the specialist and the trained soldier in these units that will do much to make them ready.

This discussion this afternoon has been a very broad brush and brief treatment of a very large problem which is going to affect every part of the active establishment as well as the National Guard and the Army Reserve. If you will bear in mind that we have at the moment somewhere on the order of some 500,000 or 600,000 in the National Guard and in the Army Reserve, and the legal limit placed on this same force is 1,692,000. The strength of our active Army today, scattered all over the globe, is only slightly more than a million which is not as large as the 1,692,000 we are talking about in the ready reserve. Also, it should be pointed out to each and every one of you that it is a tremendous problem. It is one that will be accomplished, and it is going to require everyone's assistance, attention and understanding.

The Forum on the Future of Armor

The panel members of the forum on the Future of Armor in the order of their appearance in the text are: Maj. Gen. L. L. Doan, Chief, Armor Section, CONARC; Lt. Col. J. R. Spurrier, TAS; Col. J. H. Polk, Chief of Staff, 3d Armored Division; Col. J. L. Lee, TAS; Maj. Gen. R. L. Howze, CG, 1st Armored Division; Col. E. C. Orth, CONARC; Col. L. W. Schlanser, TAS; Col. J. A. Boulger, III Corps; Lt. Col. K. R. Richmond, TAS; Lt. Gen. C. E. Hart, CG, Second Army; Lt. Col. W. A. Dwight, R&D, D/A; Maj. Gen. T. J. H. Trapnell, CG, 82d Airborne Div.

Reconnaissance Agencies and the Need for Additional Units

General Doan—I want to remind all of you that the expressions that will be made here by the panel, and it must be the same for the audience, will be personal opinion. With that I will lead off with our first question, which is this: With the dispersion anticipated on the battlefield and the probable elimination of strongly held mutually supported Corps boundaries, is there a requirement for additional reconnaissance agencies at (a) Corps Level; (b) Division Level.

Lt. Col. Spurrier—If we disperse battalion size units upon our battlefield we automatically increase the frontage and the depth of formation. This within itself will require some troops, some units, or some means of securing that area utilizing electronic means or whatever means we can. In addition, if we disperse, it is rather obvious that the enemy will also disperse, and he will desire to secure his force and conceal his major troop concentration force. The question of what should be the size of the unit at Corps Level. Well, we feel that the present Armored Cavalry Regiment organization could accomplish this mission provided it has added certain capabilities.

We would like to extend reconnaissance over the enemy's front line to at least a depth of 100 miles. That will bring in then the sky cavalry concept or the utilization of air and electronic devices to accomplish this mission along with the capabilities of airlifting ground elements and the establishment of ground reconnaissance operations in the enemy's rear area. Further, we feel that our Armored Cavalry Regiment should have sufficient combat strength to develop an enemy situation by engaging the enemy to the point of fixing him for an atomic strike. At the Division Level, we feel that if the Reconnaissance Battalion of the division is provided certain sky cavalry characteristics to increase its capabilities of extending reconnaissance over enemy front lines it should be sufficient for the division.

At the Army Level, however, we would like to take a look at what the dispersion will do. It will certainly increase the area, the rear area of the Army. At the present time, we have one Armored Cavalry Regiment which is allocated per type army. We feel that because of the need for rear area security against partisan and airborne attacks, that possibly there will be a requirement for an additional Armored Cavalry Regiment there, plus the fact that we may have to look into the thought of unit replacement. Therefore, we would have a nucleus of armored units there to replace the battalion of the Armored Division and of the Armored Cavalry Regiment with the Corps.

General Doan—I take it then that you feel, Colonel Spurrier, that we have about the right size units provided we increase the Armored Cavalry in the Army, and provided we add the deeper coverage capabilities in the form of sky cavalry or whatever that type of unit might call for.

Colonel Polk—I would agree that the proportion of light Armor in the Army we are discussing is proper. I'm not sure that I agree that the 100 miles into enemy territory surveillance job should be given to the Armored Cavalry Regiment or the Reconnaissance Battalion. It seems to me that the pure ground surveillance job is a very big one, particularly if we concede that our battlefield will be very fluid. We will have to have a very exact ground delineation of where the enemy is, where our own forces are, in order to employ atomic weapons, or even conventional weapons. When you get into a fluid, running battle then the ability to employ these weapons is vastly restricted if you don't know exactly where your own forces are, and where the enemy is. I think that's a big job. It seems to me that this surveillance job deep into enemy territory is of more interest to a pure surveillance unit which might very well feed information into the FSCC or into the Corps intelligence or Division intelligence. I think to give this Regimental commander the whole job is setting up a terrific task for him, and I'm not sure he is capable of handling it.

COL POLK
MAJ GEN DOAN
COL LEE
COL SCHLANDER
COL BOULGER
LT COL GRAYDON
LT COL RICHMOND
CAPT YEATS

"The Future of Armor," led by Major General L. L. Doan, was one of the highlights of this year's annual meeting.

Colonel Lee—Well, I feel somewhat along the line that Colonel Polk does, and I'm probably breaking the School's line, but it's quite a mission in itself to perform the reconnaissance for those units that you are charged with close in. In addition, you normally are expected to do many other tasks not in the book as a reconnaissance unit, and part of that was mentioned in this rear coverage for partisans. I can see the Cavalry unit with its small T/O&E working 24 hours a day and hoping there were more hours in the day to accomplish the missions that are being laid on it, in my opinion.

General Robert L. Howze—The statement was made that the School believes the integrated platoon as existing now in the regular 17 T/O&E is better than the integrated company. I think it's in line with what you are discussing right now. I don't believe that the integrated platoon can operate as well as the company can. Colonel Spurrier was down and he saw my Reconnaissance Battalion during Sagebrush but as far as I know that's the only contact that the School has made with it.

General Doan—I will try to act as an umpire here. I have been involved in this some myself. We know our current organization which was presented. One of the organizations which has been tested was presented and discussed but another organization was not. We have integration at platoon level. We did test integration at battalion level and that was found to be unsatisfactory. It was my good fortune to sit in a conference with several of our people who have long experience and outstanding reputations. General White, General Collier and others were present. As a result, it was recommended and it was tested that we have integration at the company level. I think probably if we took a vote we might find 50-50 as to whether or not the platoon or the company is the best level to integrate. I think the answer will always depend on the individual's personal experience. I won't go into a discussion of the standardization of infantry and armored reconnaissance.

Unknown speaker from audience—It looks like what you are driving at is converting our reconnaissance units into a security force. Reconnaissance was never designed for that sort of operation. If we are going to have reconnaissance, let's have it for field reconnaissance. Let security forces be provided elsewhere.

Lt. Col. Spurrier—I think we have to consider, when we said 100 miles, that was the capability of the equipment. Quite naturally at that distance we should have other types of units, and I'm thinking of high performance aircraft available to the Army and the Corps. What I mean by the sky cav concept is the utilization of their electronic detection devices; the utilization of their aircraft in the performance of reconnaissance or security. With this equipment it will assist in covering gaps that the reconnaissance unit assigned a very wide front cannot physically cover.

Colonel Orth—I argue that reconnaissance and security are pretty much the same mission. You have to fight for your information. Your best reconnaissance outfit is a Combat command or some re-enforced unit like that.

General Doan—There is no big argument about the question which was originally composed by the School, but there is about organization, about what their true mission is, and about whether or not the sky cav capabilities should be included in the Division and Corps reconnaissance elements.

Armored Division Organization

Our next question is this: What should be the organizational trend in the future for Armored Divisions? (a) Larger divisions with more battalions and one or more combat commands. (b) Smaller divisions with two or three combat commands. (c) Larger divisions with no Corps. (d) Larger Corps and no Army.

Colonel Schlanser—My answer to this is possibly more combat battalions but still retaining the Corps and the Army. We know for instance that a Combat Command can easily control three or more battalions, at least up to four. Therefore, if we are going to fully utilize the capabilities of the Combat Command Headquarters and the Armored Division all the way up the line, we probably should end up with anywhere from nine to twelve combat battalions in that organization. We can add combat battalions with only a minor increase actually in service support elements, and thereby increase the combat and service ratio of the division. However, on the other side of the question you cannot reduce the number of combat battalions to any great extent without it adversely affecting your combat to service ratio. I personally feel that we have a requirement for both the Corps and the Field Army headquarters. If you eliminate either one, the other organization has to take over the job that was previously performed by the one that you had eliminated. Take out the Corps, then the Army headquarters has to assume the whole job.

I believe that rather than elimination of one of the headquarters, we should look into the proposition of the increase of the span of control at Corps and Army level. It then might be possible to have a Corps commanding a greater number of Divisions and the Army commanding a greater number of Corps. That would also help on a combat to service ratio in the long run.

Colonel Boulger—I would like to throw something else into it. How about having the separate combat command with two battalions of armored infantry, two battalions of tanks, and eliminate the Division. It seems to me that there is a constant fight all the time on the elimination of headquarters. If you have a sizeable force, you are also trying to disperse your unit as much as possible. One thing we might look into is having separate Combat Commands and eliminating the Division headquarters.

Colonel Polk—It occurs to me when we cut out some elements in the chain of command and reorganize our combat elements, what we often forget is the combat support. I am referring particularly to our Ordnance support. I suggest that when we fool around with these organizations we take a hard look at the logistic support that these various organizations are capable of giving. It seems that the Division formation now is perhaps best calculated to support combat battalions the way we are laid out.

General Doan—If there are no other comments, I would like to close with this personal thought on the subject. Taking due cognizance of the logistical aspects, to me, one thing is the control and that depends immediately upon your communication. We have seen some terrific developments in communications and they still need a little ironing out. I personally do not feel I could answer this question for another year until we see what these communications can do. Your control is going to depend on how well those communications come out; as to what we can expect of the way of the means of control; or whether or not we can eliminate any of the intermediate headquarters we now have. Our next question is: Within the Armored Division where can we establish the balancing point between dispersion for protection and the massing necessary to accomplish the mission?

Dispersion of Units

Lt. Col. Richmond—There are two points to this question. First, the position of the school on the amount of dispersion to be taken by units of the Armored Divison to obtain passive protection; and secondly, how much massing is necessary to accomplish a mission, and how will we execute this meaning without unduly subjecting ourselves to the effect of hostile atomic weapons.

On the first part of it, the amount of dispersion for passive protection: During the conduct of any operation, the commanders of an Armored Division will attempt to maintain an atomic dispersion of 6,000 yards between centers of battalion size units, or other critical installations, or 4,000 yards between their perimeters. This distance is sufficient to insure that one 75 KT weapon used in average Western European terrain will not destroy more than the equivalent of one battalion or critical installation. In fact, if you place the ground zero at the exact center of a battalion size formation, a 75 KT will obtain approximately 90% personnel casualties. If you place the ground zero of the weapon midway between the two battalions, it would obtain approximately 15% personnel casualties on each battalion. This dispersion act would be maintained whenever possible in all aspects of the operation. Now, there certainly will be situations where it is not physically possible to maintain such dispersion. In these cases the commanders of the units of the Armored Division are required to increase the effectiveness of other passive protective methods, such as movement, concealment, cover, or deception so as to maintain the same degree of protection as is afforded by the 6,000 yards figure.

The other part of the question: How much massing can we do and how will we avoid presenting a target? Certainly in either offensive or defensive, or retrograde operations, the battalions may be required to mass closer than the minimum 6,000 yards between battalions. In that case, the commanders of the battalions will utilize the maximum combat power available to seize their objective in the shortest possible time. The opposite of this shortest time is the estimated relation time of the enemy atomic weapon delivery system. This reaction time that we use presently is four hours, therefore, a concentration of battalions closer than 6,000 yards between centers must not exceed four hours. Secondly, the battalion commanders will require the attacking forces to maintain the maximum contact with the enemy while they are in this undue concentration period, thereby inhibiting the enemy of his capacity and his will to deliver atomic weapons in the areas of close combat. Third, the commanders will utilize successive objectives during the attack so as to place battalions closer than 6,000 yards between centers. Obviously at certain times you must defend portions of ground with battalion size units which are closer than 6,000 yards. However, until the moment of contact with the enemy, the troops would not be in those localities. By means of these techniques, the School is convinced that this will insure adequate dispersion for the minimum passive protection in atomic warfare, and at the same time, it will permit the massing that is required by our mission without subjecting the Armored Division unduly to the threat of atomic threat. That is the current guide that is being used by all of our instructors in the preparation and conduct of their units of instruction.

General Hart—We have been generally operating in accordance with Colonel Richmond's statement in Europe. We found that we had to have two operational headquarters in order to be capable of functioning against an atomic strike completely obliterating one of these headquarters. Generally we operated according to Colonel Richmond's statement.

Airborne Armored Divisions?

General Doan—What should we look for in the way of an Airborne Armored Division in future warfare: Should it be a separate unit distinct from ground armored; or should the ground division be able to form an airborne element quickly?

Colonel Schlanser—Everyone realizes that it would be highly desirable to have an Armored Division that is capable of sustained combat, but at the same time the equipment would be light enough to take part in airborne operations. However, various echelons of the Army here realize that this is extremely difficult to foresee now. So, General Ridgway's letter of June 1955, an unclassified letter on the subject of air transportability, recognized the fact and indicated that we would be required to have two sets of equipment, the one the present day equipment or its successor which we hope in the long run will be considerably better, that can be used for sustained ground combat, and then another set that could be used to take part in airborne or air transported operations. We have given a great deal of thought to it with a feeling that there is a place for an Airborne Armored Division in the scheme of operations for the Army. We feel that it could go right along with an Airborne Infantry Division, and after the establishment, say of an air head, break out and go on to better objectives or targets that may be given to it.

Such a division, we think now, might have considerably less people in it over the long range than the current Armored Division. We would have cut down in strength on the subject of support for that particular unit, that is, in the way of repair of vehicles, and that sort of thing which might take place. As you can well realize, if we do not do something like that the aircraft requirements would be tremendous. However, we are working on such a scheme now and we think that it has a lot of potential and we can come up with one.

Lt. Col. Dwight—We do not know how much armor we can give them, but we do feel that vehicles can be made which will give airborne units considerably more ground mobility than they have today, along with firepower. Actually, we do not see at the present time any way to give them comparable armor. That almost answers the second part of this question from the standpoint of research and development, and as to whether or not there would be two types of equipment. One for ground, and one for air units. The main sacrifice can be seen today for airborne equipment is that there will be considerably less armor. Another sacrifice that may have to be made is less durability.

General Doan—We have one member of the audience, the only one I know, that has commanded both type divisions.

General Trapnell—The only equipment right now in the present Armored Division which cannot be air transported in a C124 is an M48, tank retriever and cranes. The trend in airborne is to get a defense against the tank by antitank weapons. Of course, if you get Armor into an air head, it will be highly desirable, because as you know the danger in an air head is enemy Armor. Now, with the development of this testing of a new airborne division such as the 101st, you want to get this self-sustained battle group concept. And again, the one element which will not be present there is going to be the tank, unless a tank is developed which can be air transported.

General Doan—We have only had unanimous agreement on one question. I hope that at least this hour has given you a lot to think about and that we do come up with the right answer in due time. I know we all realize the complexities and the ramifications of the problem because many of us here have been through the reorganization of Armor since 1941 until the latest concept, and we think of Armor as a part of the Army team. We are thinking in developing it, so it can be the most effective member of that team and render the greatest possible efficiency in its operation.

The presentation of the four problem areas by four instructors at The Armor School was, indeed, one of the highlights of the two-day Armor Association meeting. This article and the following presentations highlight these areas. To say the presentations were provocative is only half the story. They also serve to keep us informed of the progress we are making.

ARMORED INFANTRY AND RECON UNIT ORGANIZATION

By LIEUTENANT COLONEL JAMES T. BURKE

TWO of the problems presently confronting Armor are in the area of organization. The first of these is found in the organization of the reconnaissance units which are presently under consideration for inclusion in the armored division, the infantry division, the armored cavalry regiment and in the tank and armored infantry battalions.

Reconnaissance Units

Before discussing organization, let us look at the normal employment of reconnaissance units. Experience in World War II and in Korea has verified the doctrine that units performing reconnaissance and security must be capable of engaging the enemy in combat because they must fight to obtain the necessary information. Reconnaissance units normally are employed on wide fronts with platoons being assigned proportionate shares of the mission. Those platoons frequently are not within supporting distance of each other or by other units. This dictates that the platoon must take with it those elements considered necessary to the accomplishment of the mission. Regardless of the basic organizational structure, it will be more normal to form platoon-size integrated teams for the execution of the reconnaissance and security missions. As currently organized, the integrated platoon is capable of operating under these conditions.

With this in mind, let us look at the reconnaissance unit organization as it exists in the current army and as it is being considered for the future. In the army, we have the integrated platoon, with its organic tanks, armored infantry, scouts and fire-support element. This platoon is organic to the reconnaissance company in the reconnaissance battalion of the armored division and the armored cavalry regiment, and also to the separate company in the infantry division. It is organic to all tank and armored infantry battalions as a separate platoon in the headquarters and service company. During the past two years, considerable study and testing have been conducted to determine whether this is the optimum reconnaissance unit organization. As a result of those studies and tests, a new armored cavalry company organization has been proposed. This organization consists of two light tank platoons, one scout platoon and one armored infantry platoon (less the machine gun squad). This organization is commonly referred to as the integrated company. It has its fire support element in two 4.2 inch mortars in a section in the company headquarters. *See Figure 1.*

At the present time, both the integrated platoon and the integrated company organizations are being considered for assignment to units requiring organic reconnaissance forces. The integrated company is being considered for the armored cavalry battalion of the armored division.

Primarily due to a requirement to save personnel spaces, the integrated platoon organization, as found in the current army, has been utilized in the armored cavalry battalion of the infantry division. The scout platoon in the integrated company has been placed in all tank and armored infantry battalions in lieu of the integrated platoon.

LIEUTENANT COLONEL JAMES T. BURKE, Armor, a Norwich University graduate, entered active service in May 1941. He served in Europe during World War II in the 6th Cavalry Regiment. Subsequent to the war he served as ROTC Instructor at the University of Arizona. He attended the Advanced Armor Officers Course in 1949. He returned to Europe and served with the 14th Armored Cavalry Regiment in various capacities. Since October 1953, he has been an instructor in Reconnaissance Unit Tactics in the Command & Staff Department, The Armor School.

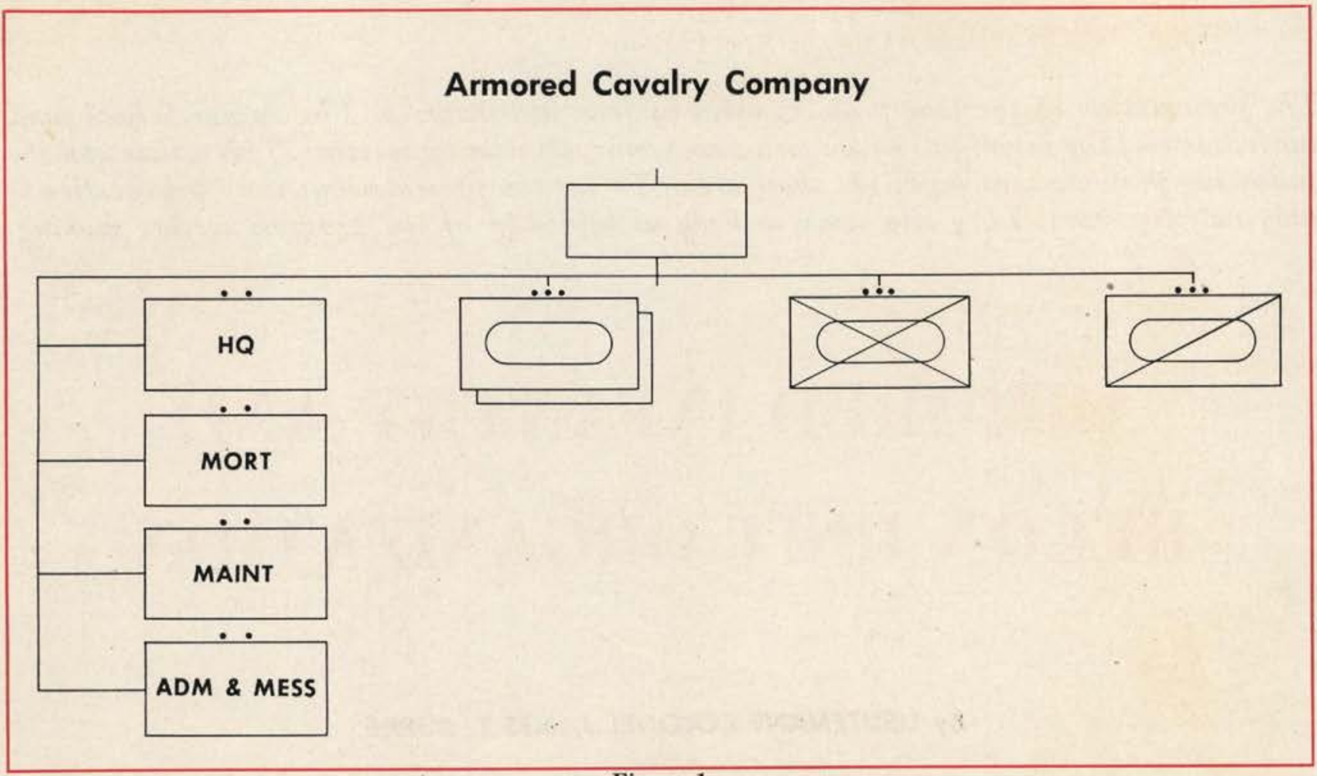

Armored Cavalry Company

Figure 1.

The need for a reconnaissance unit capable of engaging the enemy in combat has been proved. The continuing requirement, as dictated by the mission and the frontages assigned, for operating in platoon-size integrated teams is an accepted fact. Integration at platoon level provides a force capable of performing a major portion of the assigned missions without alteration. If the mission dictates, like elements, *i.e.*, tanks, armored infantry, scouts or mortars, can be grouped and employed under a single leader who has been trained to lead any or all of these elements. The separate platoon in the tank and armored infantry battalion must be capable of performing the same missions and engaging in the same types of action as the organic platoons of the armored cavalry company. The integrated platoon was organized as a result of World War II experience. It has proved its combat effectiveness and capability to perform its assigned missions in combat operations in Korea. There has been no study or test which definitely proves that the integrated company organization has a greater capability for performing the mission usually assigned reconnaissance units than has the integrated platoon organization.

We are headed into a situation in which we will be confronted with three different types of organizations designed to perform missions that require units with exactly the same capabilities. Our solution to this problem is standardization. We contend that the reconnaissance units of the tank and armored infantry battalion, of the infantry division, of the armored division, and, finally, of the armored cavalry regiment, should be a standard reconnaissance unit organization. The integrated platoon should continue to be the standard basic organization of these reconnaissance units. This will provide reconnaissance elements suitably organized to perform all missions normally assigned. Training the platoon as a combined arms team through all training phases enhances its ability to function as a team under any and all combat conditions.

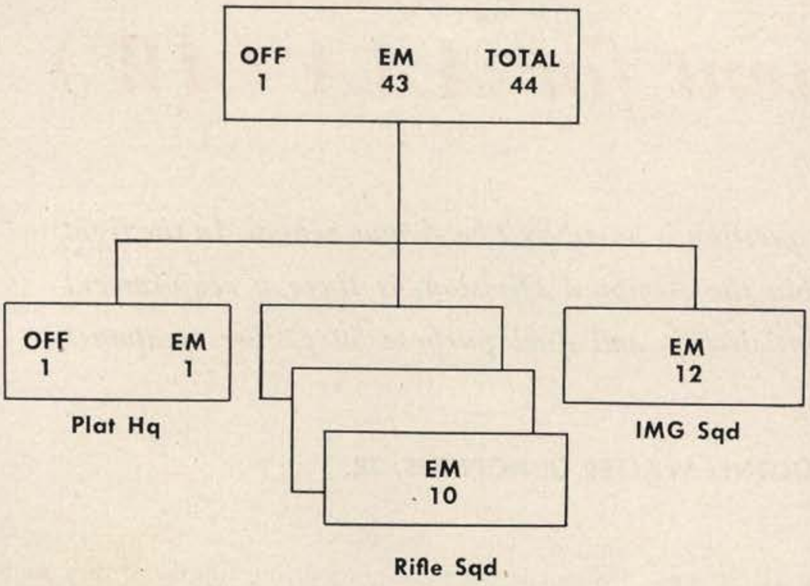
Armored Infantry Units

Our second problem in organization is found in the squads and platoons of the armored infantry company. The problem here is to increase the combat power of the armored infantry. One step was taken when we were directed to organize rifle squads of 12 men, including the driver of the armored infantry vehicle. However, we are convinced that the combat power of the armored infantry platoon can be further increased with no further increase in personnel.

First, let's consider the mission of armored infantry. One of its primary missions is to assist the advance of the tanks. This requires the close-in protection of the tanks furnished by dismounted armored infantrymen. The required protection can best be furnished by individuals equipped with rifles and automatic rifles. In Armor, the ground-mounted light machine gun is primarily a defensive weapon. True, it does have an offensive application; however, in a fast-moving action, in which dismounted armored infantry must accompany the tanks, the light machine gun is cumbersome and difficult to manhandle. The personnel assigned to the machine gun squad could be more profitably employed if equipped with rifles and automatic rifles.

In the current army and in contemplated future armored infantry units, the light machine gun is carried in each rifle squad vehicle for use when required. We do not propose that this be changed; however, it is our

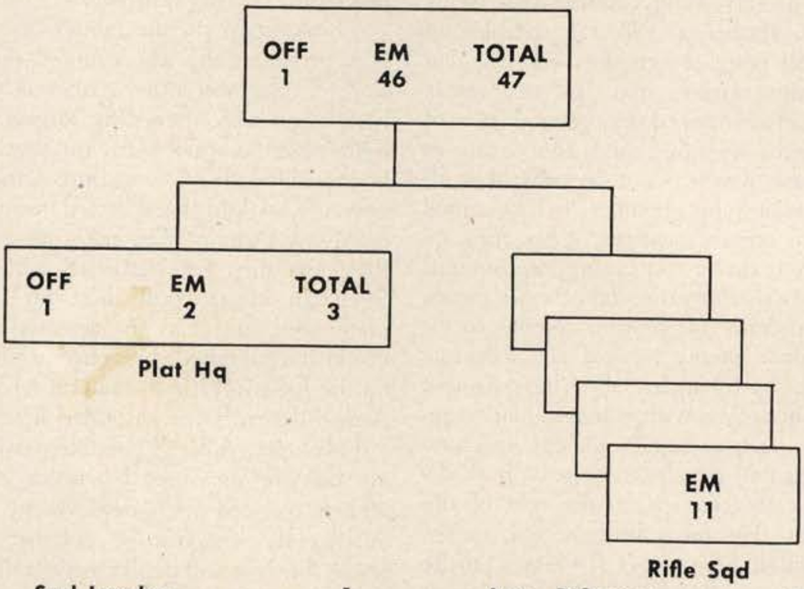
The Present Armored Infantry Rifle Platoon



Sqd Leader	1	Auto Rifleman	1
Asst Sqd Leader	1	Sr Riflemen	3
Driver	1	Asst Auto Rifleman	1
Riflemen	2		

Figure 2.

PROPOSED ARMOR SCHOOL
Armored Infantry Rifle Platoon



Sqd Leader	1	Auto Riflemen	2
Asst Sqd Leader	1	Sr Riflemen	2
Driver	1	Asst Auto Riflemen	2
Riflemen	2		

Figure 3.

contention that these machine guns plus the caliber 50 machine guns on the armored infantry vehicles and the additional automatic rifles, which we recommend, will provide sufficient automatic weapons firepower to perform any defensice mission.

The present armored infantry rifle platoon is organized in three rifle squads and a light machine gun squad. *See Figure* 2. Remember, the problem is to increase its combat effectiveness. To accomplish this increase, we would eliminate the light machine gun squad and reorganize the platoon into four rifle squads. *See Figure* 3. Each rifle squad consists of 11 men, including the driver of the armored infantry vehicle. Two men in each squad would be armed with automatic weapons.

On the surface, this does not appear to make much change; however, let's take a look at the results obtained by counting the weapons in the platoon. Considering only the rifle platoons of the four armored infantry battalions in the armored division, we have:

1. Increased the number of rifles in the division by 144.

2. Increased the number of automatic rifles in the division by 240.

3. Decreased the number of light machine guns by only 48.

We still have 192 light machine guns with sufficient personnel to man them available in the rifle squads. We have gained 384 weapons, two-thirds of which are automatic weapons, at a cost of only 48 ground-mounted light machine guns. This is a good exchange. Our doctrine calls for the employment of tanks and armored infantry as a team. The loss of these ground-mounted machine guns is minimized because all machine guns mounted on the tanks and armored infantry vehicles of the tank-infantry team are utilized to provide automatic weapons fire support.

Without increasing the strength of the rifle platoon, we have provided 48 additional rifle squads. Each of these squads represents the rifle and automatic rifle combat strength of one armored infantry battalion. This is the manner in which we would increase the combat effectiveness of the armored infantry units in the armored division.

THE ARMOR SCHOOL Requirement for AAA (AW)

In this problem area the question is posed by The Armor School: In the light of past experience, within the Armored Division, is there a requirement for the organic light antiaircraft and dual purpose 50 caliber weapons?

By COLONEL WALTER G. HOPKINS, JR.

THE tremendous potential of Armor formations for decisively influencing the course of ground combat operations serves to focus the attention of the opposing force on Armor formations. It can be expected that all possible enemy means of firepower will be employed against friendly Armor formations. Not the least of these means of firepower is that afforded by tactical air. It is reasonable to expect that a potential enemy will attempt in part to counter the mobility of armor by concentrating his efforts on opposing Armor. This effort will include tactical air and light aircraft used for battlefield surveillance, adjustment of artillery fires and observation. The advent of the supersonic fighter-bomber has raised serious doubts as to the effectiveness of the organic antiaircraft automatic weapons and dual purpose 50 caliber weapons of the armored division, and in some quarters has resulted in the conclusion that the retention of the present organic weapons of this type in U. S. Army divisions is not warranted. Further, that there is no need for mounting antiaircraft weapons on armored vehicles. It is believed that in the development of this conclusion, a significant consideration has been ignored—that is the type target presented to tactical aircraft by combat formations on the ground, which has definite bearing on the speed and altitude of attacking aircraft. An Armor combat formation properly dispersed in movement or position does not offer an area target to aircraft using conventional weapons. Rather, it offers a complex of small point targets. Considering that future warfare may not necessarily be characterized by general use of atomic weapons, and that even in atomic war it is not probable that all or most fighter-bombers will be armed with atomic weapons, it becomes apparent that a continuing requirement will exist for provision of some means of defense for ground combat forces against enemy tactical air. Effective attacks by fighter-bombers against point targets with conventional weapons, such as bombs, rockets, machine guns and napalm, requires a high degree of accuracy on the part of the pilot. He must observe the target, position his aircraft for attack, make his target run by aiming his aircraft at the target, and close to within a relatively short range before releasing or firing his weapon.

COLONEL WALTER G. HOPKINS, JR., Artillery, graduated from the University of Oklahoma. He served with the 2d Infantry Division from July 1939 to August 1947 as battery officer and battalion commander in the 2d Infantry Division Artillery. Graduating from C&GSC in 1948 he was assigned to EUCOM as Field Artillery group and battalion commander. He served as instructor and Executive Officer of the Combined Arms Department of The Artillery School from July 1951 to July 1953. Since then, he has been Chief of the Artillery Branch, C&S Department, TAS.

It is logical to assume that most fighter-bomber attacks will be delivered at relatively slow speeds and in a diving attitude, if they are to be effective against point targets. In fact, U. S. Air Force air-to-ground gunnery manuals describe such attacks in the speed range of 350-450 mph. Experienced fighter-bomber pilots state that in the interests of accuracy, and in the absence of "flak," attacks on point targets would be made at even lower speeds. The mere knowledge that a target is defended by light antiaircraft, however, may influence the pilot to increase the speed of his target run and will result in an appreciable loss of accuracy.

Think again on the matter of targets presented by an Armored division. Tanks and other armored vehicles are very interesting targets to fighter-bomber pilots. An intelligently conceived air effort against Armor, however, would be directed toward depriving Armor of momentum and the capability for sustained action. Such an effort could best be implemented, as far as the armored division is concerned, by concentrating on the logistical life-lines upon which Armor depends for sustained action.

Employment of all possible passive air defense measures by trains elements, coupled with deployment of antiaircraft weapons in defense of trains, bridges and defiles against dive attacks, provides the commander with some degree of assurance for maintaining the combat effectiveness of his force in action.

What if a potential enemy division were deprived of light antiaircraft for his use? An American fighter-bomber pilot, informed of such action, would certainly welcome this situation. His delivery accuracy of air strikes would also be substantially increased. There is no reason to doubt that this would also apply to pilots of a potential enemy if United States Army divisions were deprived of light antiaircraft weapons and dual purpose 50 caliber weapons.

Certainly the current light antiaircraft weapons and dual purpose 50 caliber weapons organic to the armored division are not the final answer. But, until something better comes along, they are the only answer to the problem of defending against aircraft operating over the combat zone at altitudes below the radar horizons of systems capable of directing aircraft, missiles, and gunfire against hostile aircraft. The maximum effort should be made to capitalize on the limited capability now available, while developing more accurate and effective weapons for the future. This can be accomplished for the present by a reevaluation of doctrine for the employment of these weapons from the point of view of realistic consideration of aircraft capabilities in the attack of the type of targets presented by an armor formation.

True, the problem of supersonic aircraft speeds cannot be ignored. However, nor should be ignored the hard fact that aircraft while moving at such speeds, armed with conventional weapons, offer no particular threat to a tactically dispersed Armor combat formation.

To conclude that light antiaircraft has no place at present in United States Army divisions is to lose sight of a lesson learned at great expense in the Korean conflict. In air-to-air combat, United Nations forces lost 89 jet fighters. During the same period, 676 aircraft were lost to ground fire. In the final phase of the campaign, instructions were published restricting pilots to a 3000 foot minimum recovery altitude in the attack of ground targets, to reduce unnecessary losses. A considerable degree of accuracy was sacrificed by this action but was accepted to reduce losses during the peace talks.

The results of this experience, which saw high-performance jet aircraft opposed by World War II type antiaircraft weapons and by small arms fire, do not support the conclusion that presently available light antiaircraft weapons are virtually ineffective against present-day aircraft. Major Andrew T. Soltys, then Antiaircraft Intelligence Officer at Headquarters Far East Air Force, flatly refuted the thesis in 1954. Writing in the spring 1954 issue of the *Air University Quarterly* (Vol. VII, Nr 1) on the subject of *Enemy Antiaircraft Defenses in North Korea,* Major Soltys stated: "Most of the loss and damage sustained by United Nations aircraft was inflicted by light antiaircraft weapons and small arms, particularly on the large segment of missions devoted to interdiction and close support."

Further, to go back to World War II, in the book entitled *Methods of Operations Research,* by Morris Kimball, there is a graphic description on how we want to analyze effectiveness of light antiaircraft weapons, to include the dual purpose 50 caliber weapons. It states this: "At the beginning of the war, a great number of British merchant vessels were seriously damaged by aircraft attacks in the Mediterranean. The obvious answer was to place antiaircraft weapons on the ships." However, the results which were gathered after the weapons had been placed on the ships showed that the antiaircraft weapons firing at 100 aircraft in 100 attacks had achieved only four percent hits. This raised doubts as to their effectiveness, and many individuals said, "We don't think that these antiaircraft weapons are paying for themselves." Of course, four percent hit is a poor showing and seems to indicate that the guns were not worth the price of installation. However, why were these guns placed on the ships? It was for the protection of the ship; in other words, to keep the ship from being damaged or sunk. They were not placed on the ships to shoot down enemy aircraft. With this in mind, let us now check and see by factual data what happened in this particular situation. After the conversation and after the points went along for over a year, they finally sat down and analyzed the effect of antiaircraft firing versus non-firing of antiaircraft weapons at attacking aircraft. It was found that enemy planes attacking ships which had a light antiaircraft capability were able to get only eight percent hits. Of this eight percent, only 10 percent of the ships sank. On the other hand, aircraft attacking ships without a light antiaircraft capability were able to get 13 percent hits, and of this 13 percent, 25 percent of the ships were sunk. This numerical analysis finally settled the question, for the antiaircraft guns more than paid for themselves if they reduced the chance of the ship being sunk by a factor of more than two. These are only two examples.

The requirement for antiaircraft protection for Armor extends beyond the need for protection against munition-delivering aircraft. Armor also needs a means to counter aerial observation and surveillance accorded by the enemy to locate troop formations and detect targets engaged by artillery and by atomic weapons. A potential enemy can be expected to employ several types of aircraft to perform battlefield surveillance, low altitude photography, group reconnaissance, artillery adjustments, both atomic and conventional, and similar missions. Helicopters and light aircraft of the L19 type are well suited for such missions, and would undoubtedly be employed extensively in these roles. Now, aircraft of these types are highly vulnerable to automatic weapons fire, and can be denied freedom of operation over the division zone by the firepower of the organic antiaircraft automatic weapons and by dual purpose 50 caliber machine guns. Outside the sphere of air defense, organic light antiaircraft offers another important advantage to the force of which it is a part: That of a tremendous potential for delivery of a heavy volume of automatic weapons fire on surface targets.

I am sure that all are familiar with the tremendous amount of firepower that these weapons can lay down in a short period of time, and they were used extensively during the Korean conflict.

In summary, then, it is believed that retention of organic light antiaircraft weapons and of the dual purpose 50 caliber weapons in the armored division should receive favorable consideration and thought in the light of past experience.

Class III Resupply in the Armored Division

By MAJOR ROBERT L. WESTBROOK

A SEVERE logistical problem has been created by the fuel demands of modern military vehicles engaged in combat operations. This problem is further complicated because of the increasing need for military operations to be conducted over a wide variety of terrain and climatic conditions. Our fuel requirements have been steadily increasing since World War II. In World War II, to move the Armored Division 100 miles, 146,000 gallons of gasoline was needed; to move the Armored Division 100 miles today, it takes 226,182 gallons of gasoline. It is important to note that these consumption figures are for road movement. To move cross country, this distance, the consumption would be more than doubled.

The question presents itself—Why such an increase in fuel consumption of the armored division? Really there are two answers to this question. First, the armored division today is a little larger than the armored division that we fought with in World War II. Second, the M48 tanks we are using today consume more gasoline than the tanks with which we fought World War II. How can we improve this fuel consumption?

Constant study is being made in the automotive design of the M48 tank. We now have an M48 tank with an improved automotive design which has just finished the service test at CONARC Board Number 2. The automotive design improvement is a fuel injection system instead of carburetion and an improved cooling system. With these automotive design improvements, this tank will more than double the operating range of the present M48 tank.

Since the fuel consumption is so great in the Armored Division, we are required to place reserves of gasoline at all echelons. Today we have reserves of gasoline forward with the combat elements, and the combat elements will divide this reserve, placing a portion of it back in their field trains located in the Combat Command trains area. Our division G4 will position the division reserve of gasoline, which consists of 30,000 gallons, into either the division trains area or push it forward into the DSCP area. With these reserves of gasoline, we are able to cope with this large problem of providing the proper amount of fuel at the right place and at the right time.

We have another special problem. Our tanks must reach the line of departure with gasoline tanks full. If we have to assemble an armored division from widely dispersed assembly areas to a forward concentration area prior to an attack, a large portion of the organic fuel supply will be used on this move. We must insure that the tanks cross the line of departure with full gasoline tanks. We can accomplish this by placing jettison tanks or drums on the decks of our tanks and the driver can jettison these drums at any time. Gasoline needed for the move to the line of departure will be from these drums, thus saving the principal fuel supply. Our allies have also developed a one-wheel fuel trailer which is available for this use. It also can be jettisoned.

The School is firmly convinced that the 5 gallon can method of refueling is not the most suitable method of refueling for the armored division. We need some system of bulk refueling.

In order to institute such a system, The School has recently recommended to CONARC that we be allowed to place in our TOEs a bulk refueling vehicle which will take care of from 50 to 60 percent of our refueling needs. This recommendation has been approved.

Another method of providing bulk refueling, and a new one, is by the use of rubber fuel containers. Several commercial organizations are making these rubber fuel containers. The containers can be made any size; however, the 500 gallon size appears to be the most desirable. The container is built on the principle of a life-saver tube, *i.e.,* with raw rubber on the inside. If it is penetrated by a projectile or a fragment, then the container will immediately seal itself with little or no loss of gasoline. We feel that eventually we can replace the tanker truck, which we have recommended, with these rubber refueling containers being transported by a cargo vehicle which will have the cross country mobility of the present tank.

With this new system of providing bulk refueling, we can improve the techniques of delivering gasoline. By packing these fuel containers in the division trains area, it is entirely possible that we can deliver these containers by helicopter directly from the division trains area to the using unit, bypassing the division supply control point and the combat command trains. This will allow us to deliver gasoline faster and save the labor which is a great problem in 5 gallon can refueling.

A tanker helicopter is being studied at the present time. This tanker helicopter is designed to refuel vehicles while hovering over them. The tanker helicopter will go forward into the areas where the gasoline is needed and hover over the tanks while a hose of 75 to 100 feet is dropped down and the tank is refueled. This system presents some disadvantages. If it is used in the forward area, obviously these tanker helicopters could be seen by enemy forces. It would indicate an armor concentration in the area. During this refueling the helicopter would be quite vulnerable to air attacks.

The fuel problem in the armored division today presents implications which must be eliminated. We feel by constant study, improvement of design of equipment and by the improvement of delivery devices, we can eliminate a large part of the problem.

MAJOR ROBERT L. WESTBROOK, Armor, served in Europe during World War II with the 9th Armored Division. After a Stateside tour he returned to Germany on occupation duty with the Constabulary. Returning to the States, he served with the 3d Cavalry Regiment and attended The Armor School. He later attended the Canadian Army Staff College, then joined the C&S Department, TAS. He is presently an instructor in Personnel and Logistics Division, Command and Staff Department, The Armor School.

U. S. Army

DEFENSE BY ARMOR

By LIEUTENANT COLONEL KIMBALL R. RICHMOND

This last, but not least, problem area deals with Armor in the defense when employed with the type Corps. It also discusses utilization of the current mobile defense as employed by the Armored Division. In proposing a "new" type mobile defense the adjective is slightly misleading in that this type defense was used during World War II by the 4th Armored Division at the Nancy Bridgehead and the 7th Armored Division at St. Vith. The fundamentals are the same but some of the terminology is new in that it has never been stated within the Army Field Manuals. It is understood that Lieutenant General Bruce C. Clarke, Commanding General of the Seventh Army, approves this concept and will implement it in Western Europe.
THE EDITOR

ONE of the basic responsibilities of The Armor School is the analysis, improvement and modification of armor doctrine. For some time, the School has concentrated on the doctrine for the armored division in defense. The yardstick used to measure the effectiveness of tactical doctrine was the fundamental belief that the armored division in any type defense should be so utilized as to exploit to the maximum the characteristics of Armor's power—that is, mobility, armor protected firepower, shock action, extensive communications, flexibility of organization, organic mobile logistical support and responsiveness to command.

Position defense as currently contained in our field manuals was measured by this yardstick. The conclusion of the School in this case was to reject position defense as being unsuitable for employment by the armored division.

Next, as a result of working with mobile defense as presently written, it became obvious that this form of defense was really a variation of position defense on an extended front with a large mobile reserve. It became readily apparent that the defensive doctrine for the armored division required extensive modifications to successfully participate in modern warfare. As a point of departure, the School considered that mobile defense of today was really position defense of tomorrow for the armored division, and that the armored division needed a real mobile defense doctrine with the emphasis on the *mobile*. This new mobile defense doctrine has been produced.

The School holds the position that instead of having position and mobile defense as presently stated in our field manuals, the armored division should employ current mobile defense and new mobile defense as required by the situation. I might say at this point that the Command and General Staff College and CONARC do not agree with us on new mobile defense. I will discuss some of their objections later.

My real purpose is to present the present views of The Armor School on these three associated subjects:

1. The employment of the armored division within a type corps on the defensive.
2. The utilization of current mobile defense doctrine by the armored division.
3. The concept and use of our new mobile defense by the armored division.

Employment of the Armored Division in the Type Corps on the Defensive

Striking Force. The School believes that the armored division when operating as part of a type corps in defensive action, is best employed by utilizing the division in purely offensive action. The employment of the armored division as a corps striking force will result in such offensive employment. When acting as the corps striking force, the armored division may be employed to counterattack and destroy enemy penetrations or it may be used to conduct limited offensive actions such as spoiling attacks.

Covering Force. It seems quite cer-

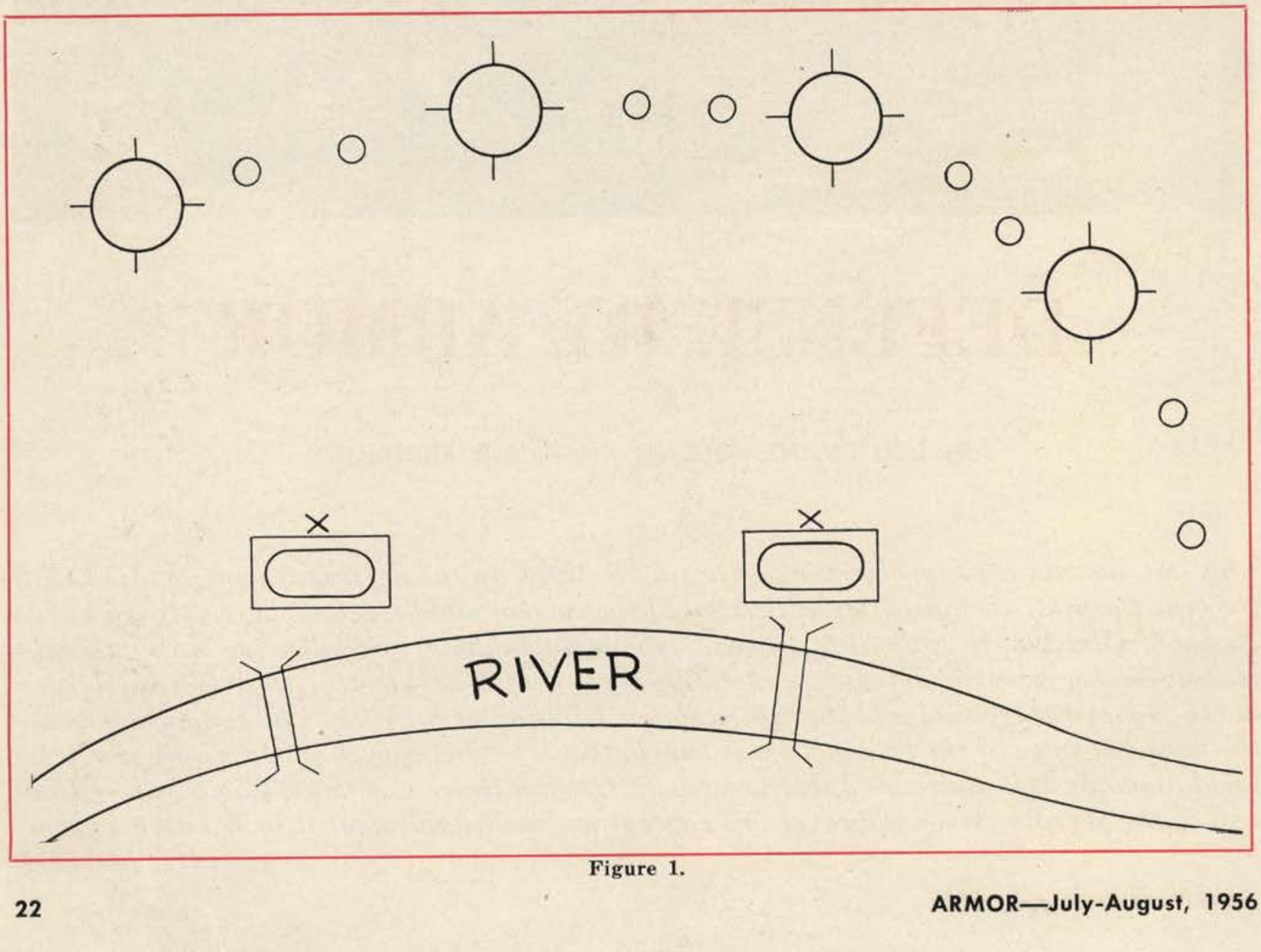


Figure 1.

tain that when the type corps is conducting a defense in terrain such as Western Europe and against a modern enemy army that contains major armor elements, the armored division will initially be used as a covering force for the corps. Although the armored division while operating as a covering force utilizes action other than pure offense, the School feels that the use of the armored division initially as a corps covering force is the best solution to the problem with the tools presently available to the corps commander. Moreover, the armored division when acting as the corps covering force does not utilize offensive action at every opportunity. and in a typical covering force action on a corps front, such opportunities for offensive action are frequent.

Defense of a Zone. The first two uses of the armored division—that is, as the corps covering force initially and then as the corps striking force—are employments of the armored division acceptable not only to the School, but to CONARC and the Command and General Staff College. The doctrine for the utilization of the armored division in these two roles is adequately covered in our present field manuals. A continuous series of studies based on the employment of various type corps in defensive action in Western Europe indicates that a major task of the type coprs will be to prevent the advance of large enemy armored formations who are advancing down major avenues of approach. These avenues of approach are generally favorable for the offensive employment of large armor formations but they are not particularly conducive to effective defense by infantry formations. It is the conviction of the School that the defensive doctrine of the type corps for Western Europe should include the employment of the armored division as a major formation to defend those positions of the corps zone most favorable for enemy armored approach. By defending a zone, we mean that the armored division would, within its capabilities, deny to the enemy the use of these major avenues of approach. We are not talking about the defense of any particular line, position, or locality.

Utilization of Current Mobile Defense Doctrine by the Armored Division

As I have previously stated, The Armored School rejects position defense as presently included in our manuals as being unsuitable for use by the armored division. The Command and General Staff College concurs in this rejection of position defense for the armored division. The School now is convinced that present mobile defense is really but a variation of position defense on an extended front with the use of a large mobile reserve. I wish to emphasize the point that the School does not reject present mobile defense as a type of tactical defense for the armored division, but rather that the use of present mobile defense is limited to those situations wherein the armored division cannot effectively employ either offensive action or dynamic defense. This reasoning is based on our fundamental yardstick

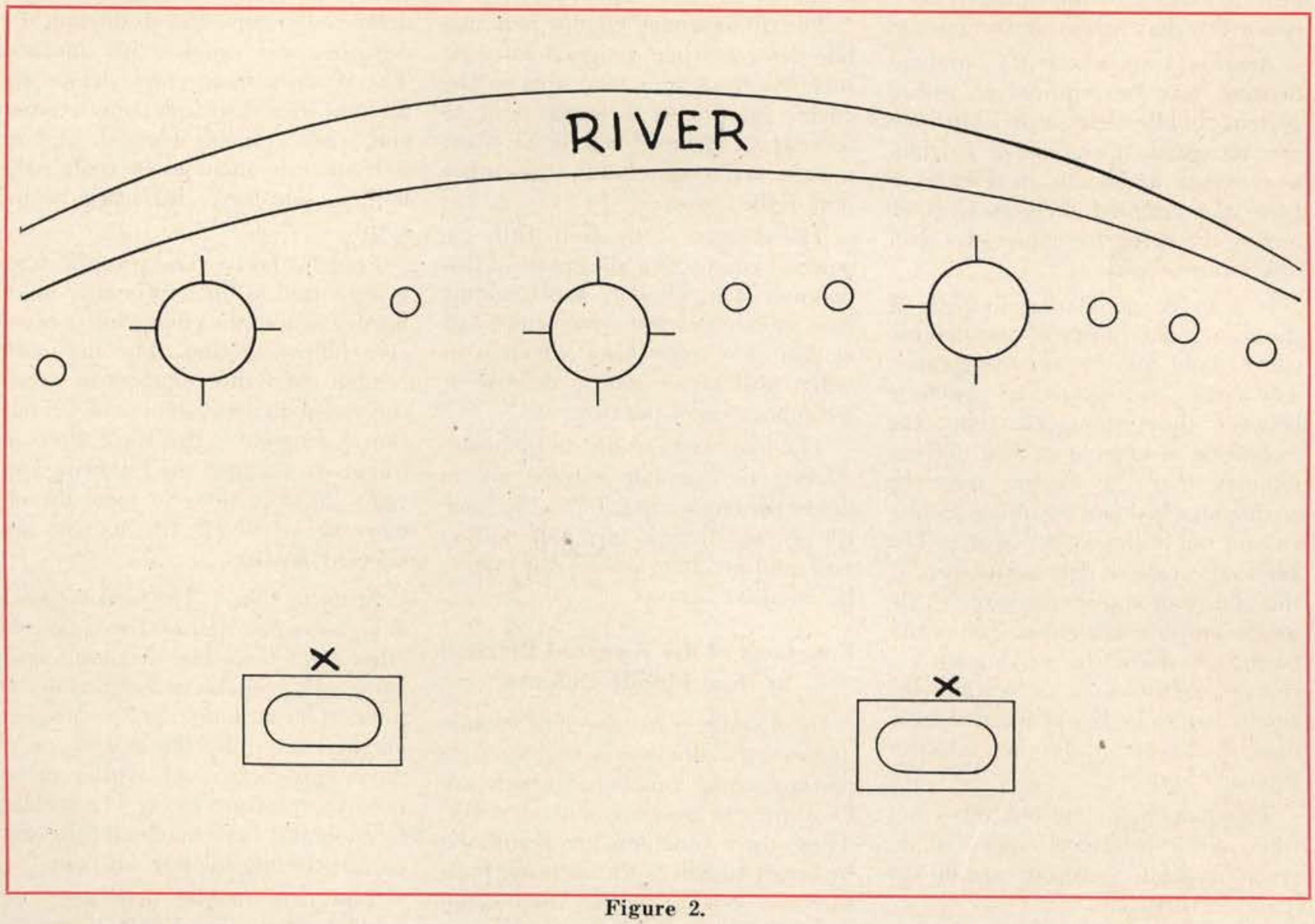


Figure 2.

for tactical doctrine—which is to measure the effectiveness of tactical doctrine by the relative amount of exploitation of the offensive characteristics of armor permitted by the particular doctrine.

Present mobile defense will be utilized by the armored division when required by certain conditions of the mission, enemy capabilities, the terrain and weather, or capabilities of our own troops available. There are several type situations wherein we are sure that present mobile defense may be used in order to effectively accomplish the mission.

Frequently during offensive operations the armored division will be required to not only seize the corps objective but to hold that objective pending the arrival of the remainder of the corps. The mission of the division may well demand the use of current mobile defense as shown in *Figure 1*. Near the bridges are the elements of the division striking force. This striking force is prepared to lash out and to strike and destroy enemy forces that threaten to penetrate the defensive position. The object of this defense is to prevent the enemy from gaining control of the bridgehead; it is not the destruction of the enemy.

Another case where the armored division may be required to utilize current mobile defense is during either retrograde operations or a defensive action as shown in *Figure 2*. Here the armored division is maximizing the defensive values of a river line as an obstacle.

It is to be noted that in both of these cases the object of the defense was to hold the line of strongpoints. The enemy is expected to penetrate between these strongpoints but the technique of current mobile defense requires that the enemy force be counterattacked and destroyed or driven back out of the defensive area. The key to this type of defense is basically the ability of the strongpoints to canalize and slow the enemy forces sufficiently to allow the striking force a chance to attack and destroy the enemy before he has penetrated more than an acceptable distance into our defensive zone.

These examples are but two cases wherein we believe the armored division might use current mobile defense doctrine.

May I emphasize that we do not reject current mobile doctrine, but we strongly believe that the armored division's offensive characteristics are not maximized by it. Therefore, we prefer the adoption of pure offensive action or new mobile defense if possible.

The new mobile defense for the armored division is an action designed to maximize the employment of mobile combat power. New mobile defense is characterized by a combination of offensive and retrograde actions, with the success of the defense depending upon offensive action. This is the only type of defensive action which allows for the full employment of the combat potential of the armored division and makes use of its characteristics of mobility, armor-protected firepower, shock action, extensive communications, flexibility of organization, organic mobile logistical support and responsiveness to command. This form of defense also reduced vulnerability to attack by mass destructive weapons. Regardless of the frontage on which the division operates, new mobile defense will be, almost exclusively, the type of defense adopted by the armored division.

The division may employ new mobile defense when assigned missions such as: to deny a vital area to the enemy, to protect a larger unit, to contain an enemy force, or to effect maximum attrition and disorganization of the enemy.

The division is, by itself, fully capable of conducting all aspects of this defense. The division may conduct new mobile defense when employed as part of a larger force which is in either position or mobile defense or a combination of the two.

The basic tasks of the division conducting new mobile defense are to detect the enemy attack force, to force the enemy into a favorable killing area, and finally to destroy the enemy by offensive action.

Functions of the Armored Division in New Mobile Defense

In organizing for the new mobile defense, the division is organized to perform three functions, which are to secure, to pressure and to strike. These three functions are performed by forces known as the security, pressure and striking forces. The composition of and the tasks assigned to each force are determined by a consideration of the mission, enemy, terrain and weather, and combat power available. However, the division commander may, during the course of battle, shift all or any portion of one force to any of the other forces. Thus, the pressure force may well, in the course of battle, become the striking force, and *vice versa*. This shifting of combat power does not reduce or eliminate the necessity for the timely availability of adequate strength to accomplish each of the three functions. Additionally, all of these functions may well be performed by a single major subordinate element of the division during one action without any significant readjustment of forces within the division.

Security Force. The security force is organized to provide security for the division. The division is capable of establishing its own security force and will utilize the minimum essential units in the accomplishment of this function. Security forces are assigned the following missions: to provide early warning and information of the enemy; to deceive the enemy and force his early deployment; to delay the enemy; and to disrupt, disorganize and canalize his advance. The security force employed by the division should include army aviation and, when available, close air support; it frequently includes or coordinates with mobile forces furnished by the corps.

Pressure Force. The pressure force is organized to force, primarily by offensive action, the enemy into a favorable killing ground. The minimum combat strength competent to ensure successful accomplishment of the mission is assigned to this force. Pressure forces are assigned the following missions: to stop, slow, or repel the enemy; or to divert the enemy into selected areas.

Striking Force. The striking force is organized to destroy the enemy by offensive action. The maximum combat power available is assigned to this force. The striking force is assigned missions requiring the destruction of the enemy in front of, within, or behind the pressure force. The striking force should have maximum fire support, including nuclear weapons.

The new mobile defense is designed to take the utmost advantage of the terrain. The organization of the ground in new mobile defense differs in scope, nature and emphasis from the organization of the ground in position defense because the intention is to destroy the enemy rather than to hold terrain.

Area of new mobile defensive operations. The area utilized by the armored division may be selected by the division commander or designated by the higher commander. In any case the division commander utilizes the area so as to most effectively employ his division in the execution of his mission. A study of the terrain, combined with a consideration of the mission, the enemy, the weather and the combat power available to the division, is made in order to select the critical portions of the area. These critical portions are the killing ground(s) and the denial areas. The killing grounds are used for the destruction of the enemy attack force. The denial areas are those areas the advantage of which must be denied to the enemy in order to accomplish the plan of defense.

Selection of the killing ground(s). A killing ground or grounds are selected which permit the commander to maximize the offensive capabilities of the division while minimizing the combat effectiveness of the enemy attack force. The killing ground must be such that the enemy must enter it or can by-pass it only to enter another killing ground. The basic purpose of the killing ground is to facilitate the destruction of the enemy forces; therefore, it should have the following characteristics:

1. Facilitate the coordinated offensive employment of the striking force to destroy the enemy force either with or without the use of mass destruction weapons.
2. Observation and fields of fire adequate to maintain continuous fire on the enemy. This cannot be limited to direct fire but must include all types of fire support as well as both ground and air observation.
3. Contain or be directly related to obstacles to the movement of the enemy force, so that a minimum pressure force can restrict the enemy to the killing ground.
4. Afford suitable target areas to maximize the effects of all supporting weapons, particularly mass destruction weapons.
5. Large enough to permit entrance of an enemy force whose destruction will jeopardize the success of the enemy attack; however, the enemy force must be limited to a size which may reasonably be attacked and destroyed by the defending division.

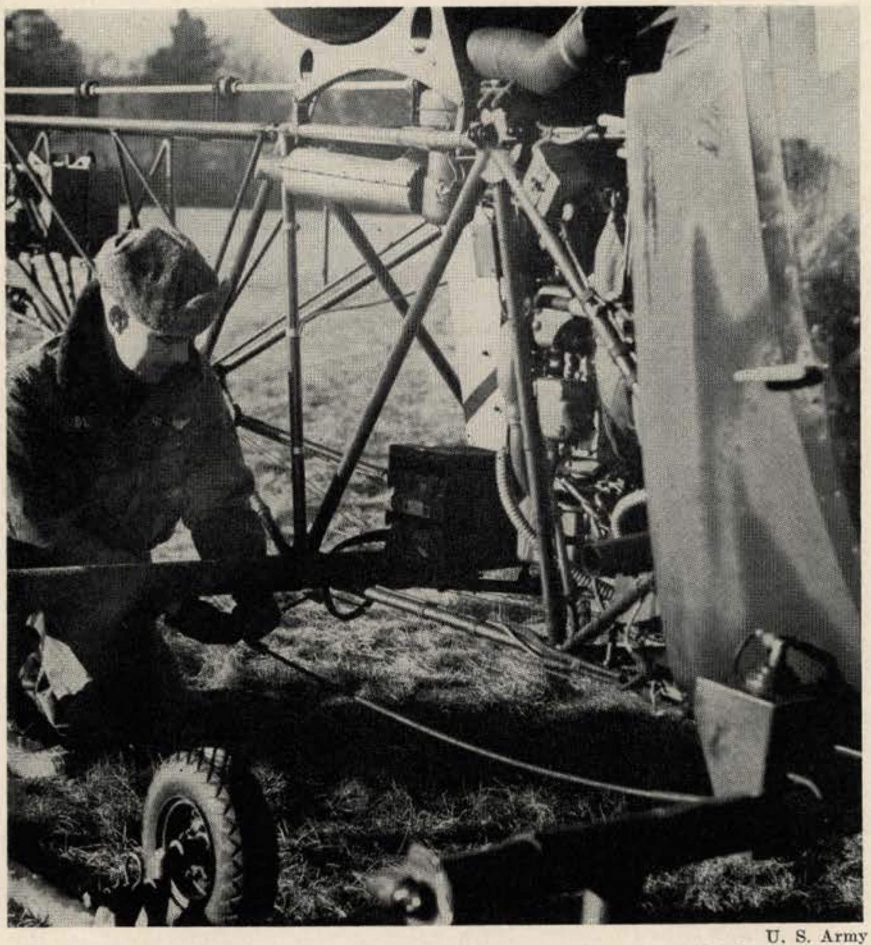
Selection of denial areas. Denial areas are areas which, if denied to use by the enemy, will allow the defending force to retain the tactical advantage. The selected denial areas must be such that the defending division can deny their use by the enemy at the critical time. The basic purpose of the denial areas is to force the enemy into the killing ground at the proper time; therefore they should have the following characteristics:

1. Critical terrain.
2. Optimizes employment of supporting weapons, natural obstacles and devices.
3. Related to the killing ground(s).
4. Deniable with minimum combat power.

In organizing for the dynamic defense, the armored division is organized to perform three functions, which are to secure, to pressure and to strike. These three functions are performed by forces known as the security, pressure and striking forces. The composition of and the tasks assigned to each force are determined by a consideration of the mission, the enemy, the terrain and the weather, and the combat power available. Simultaneously with the determination of the general size, composition and missions of the forces to be assigned to accomplish the functions of securing, pressuring and striking, the division commander determines the employment of his subordinate headquarters that will most effectively execute the plan of new mobile defense. The covering force function of the security element is normally assigned to the reconnaissance battalion. When required by the assigned mission, the area of operations, the size and complexity of the security forces, or capabilities of the enemy, the security function may be assigned to one of the combat commands. Combat commands are normally assigned multiple functions of pressuring and striking the enemy but will utilize the same forces to accomplish both functions. Pressure functions are normally assigned to two or three combat commands, and forces are attached to the combat commands as required. The entire division may temporarily constitute the pressure force. In a similar manner, striking functions may be assigned to one, two, or three combat commands. The forces attached to a combat command to execute a pressure function are normally used by that same combat command to execute striking functions at the critical time. Occasionally the division will not have any troops physically assigned as the striking force, but during such temporary periods it will have the capability of creating a striking force at the critical time and place.

Reserve in new mobile defense. The armored division in new mobile defense does not normally maintain a formally designated reserve. The habitual designation and establishment of a part of a force as a reserve, and the withholding of that force from action, do not capitalize on the mobility of Armor. Battlefield mobility—armor protection, tracked vehicles, concentrated firepower, and a mounted weapons system, together with extensive communications—permits the commander to use committed or uncommitted forces at any time as a weapon of opportunity. Units of Armor that have engaged the enemy can, by using their battlefield mobility, disengage from the enemy with relative ease and rapidity, and re-enter the battle at a more favorable or critical point. The division commander during the course of dynamic defense shifts the combat power of his division so as to ensure in turn the accomplishment of the functions of securing and detecting the enemy, pressuring the enemy into the killing ground, and finally striking and destroying the enemy. In essence, the reserve of the armored division in dynamic defense is its battlefield mobility.

LIEUTENANT COLONEL KIMBALL R. RICHMOND, Armor, a 1942 OCS graduate, was commissioned in the Infantry. During World War II, he served in Europe with the 1st Infantry Division. He next served as ORC Instructor. After attending The Armor School, he returned to Europe and served with the 63d tank battalion. Next, he graduated from the C&GSC. Since July 1953, he has been a tactics instructor in the Command & Staff Department, The Armor School.



U. S. Army

1st Lt. Lee M. Hand inspects modified antenna installation which he designed.

The modification of the long-ranged AN/VRC-8 radio which makes possible its use in place of the short-ranged AN/PRC-8 "Handi-Talki" in the 2d Armored Division's helicopters proves once again that the American soldier's ingenuity knows no limitations.

Stretching Our COMMUNICATIONS

COMMUNICATIONS capabilities of the 2d Armored Division have been given a significant boost as a result of the mechanical ingenuity of 1st Lt. Lee M. Hand, Division air communications officer.

His contribution to military communications, particularly vital in a highly mobile armored division, consists of a modification of the long-ranged AN/VRC-8 radio to make possible its use in place of the shorter-ranged AN/PRC-8 "Handi-Talki" in the division's helicopters.

Use of the more powerful radio, whose range is some 40 miles, vastly increases the importance of the Division's helicopters as links in the field communications network. Up to this time the 'copters have been equipped with the AN/PRC-8 whose range is only five miles.

The use of the AN/VRC-8 was made possible by development of a special modification in the installation of the antenna. Following out this idea, antennas are mounted on the 'copter's "crosstube" or skid structure. This underslung mounting eliminates almost completely previous dead spaces in areas of communication with ground points. The antenna, which is confined to the landing gear while the aircraft is on the ground, is released by a pulley arrangement in flight and hangs down vertically.

The radio itself, mounted between the pilot and the passenger, is integrated with the aircraft's VHF radio, so that both can employ either microphone or earphones. The weight of the radio—approximately 50 pounds —"makes a noticeable difference," according to the communications officer, "but is still well within safety limits."

The new radio is particularly adapted to armored divisions because of the wide fronts they cover and the rapid movements they make. "Just jumping between major units of the Division," Lt. Hand said, "we got 20 miles away from our own CP in the 'copters. This makes a longer-ranged radio necessary."

The helicopters are used for rapid transmission of orders, fast delivery of priority messages, reconnaissance and observation.

Thus far eight of the Division's 10 helicopters have been outfitted with the new radios. Installation of each takes two men approximately one day.

2d Armored Division Testing for
THE ARMOR LEADERSHIP AWARD

By

CAPTAIN THOMAS W. BOWEN

THE Commanding General, Continental Army Command, designated the 2d Armored Division to conduct the competition for the 1956 Armor Leadership Award. (This was reported in the March-April and May-June issues of *ARMOR*.) This award is to be made for the most outstanding tank platoon in the division. This new award is a revival of the "DRAPER TROPHY," in former years awarded to the outstanding horse cavalry platoon in the entire Army. Under the new regulations (AR 672-737), each year the Commanding General of the Continental Army Command will designate a Regular Army or National Guard Armored Division to conduct the competition. The division commander of the Armored Division designated will select platoons to participate in the competition which have demonstrated outstanding professional proficiency; a high degree of physical fitness; and exceptional disciplinary, supply and maintenance standards.

Upon receipt of their designation as the "Draper" division, the 2d Armored Division Commanding General appointed a board of officers to determine the scope of the competition to be conducted. On this board were the Combat Commanders, the Division G3 and G4 and was presided over by the then Assistant Division Commander, Major General C. Stanton Babcock. As a result of this board, recommendation as to the contents of the competition and the method of determining which tank platoons would compete were presented to the Commanding General and approved.

To limit the number of tank platoons which would be eligible to compete in the final elimination, the division allocated each tank battalion one space in the final elimination. To aid the battalion commanders in their selection and to ensure, in so far as possible, an equitable contest, the following criteria were listed for use by the battalion commanders:

1. The platoon must be commanded by a lieutenant.
2. Personnel of the platoons will be frozen as of 1 August 1956, except for replacement personnel received from outside of the division. The competition will take place in November 1956.
3. Past records of discipline, maintenance and marksmanship should be considered.
4. Each battalion commander will designate the platoon to compete on 1 August 1956 and must submit a roster of the platoon at that time with the date of assignment to the platoon of each man.

The four platoons selected from the tank battalions will be tested at the 2d Armored Division's major training area during the month of November. The test basically will cover every possible facet needed of a trained tank platoon. While the details are, of course, confidential, a general outline of the test includes the following:

1. First Day

a. *Morning:* The standard physical fitness test will be given each member of the platoon. Upon completion of the PT test, the platoon will move to a military stakes course. This course will cover subjects such as first aid, field sanitation, mine warfare, weapons training and other topics covered in the individual phase of training.

b. *Afternoon:* At approximately 1600 hours the platoon will receive a detailed combat-readiness inspection. The appearance of the men, weapons, vehicles and equipment will be checked. The stowage of ammunition and gear will be checked for neatness and availability. Special ordnance and signal teams will inspect all of the equipment technically. After completion of this inspection the platoon leader will be briefed on a tactical situation and given a warning order for a night move.

c. *Night:* The platoon will be required to move under blackout conditions (utilizing infra-red) and listening radio silence to a tactical assembly area. The road march will be of sufficient length to test march discipline and blackout driving techniques. In the assembly area the night security measures will be checked by aggressor infiltrators. During this phase the platoon leader will be given an attack order for an attack the next morning. The platoon's actions in preparation for the attack will be closely observed.

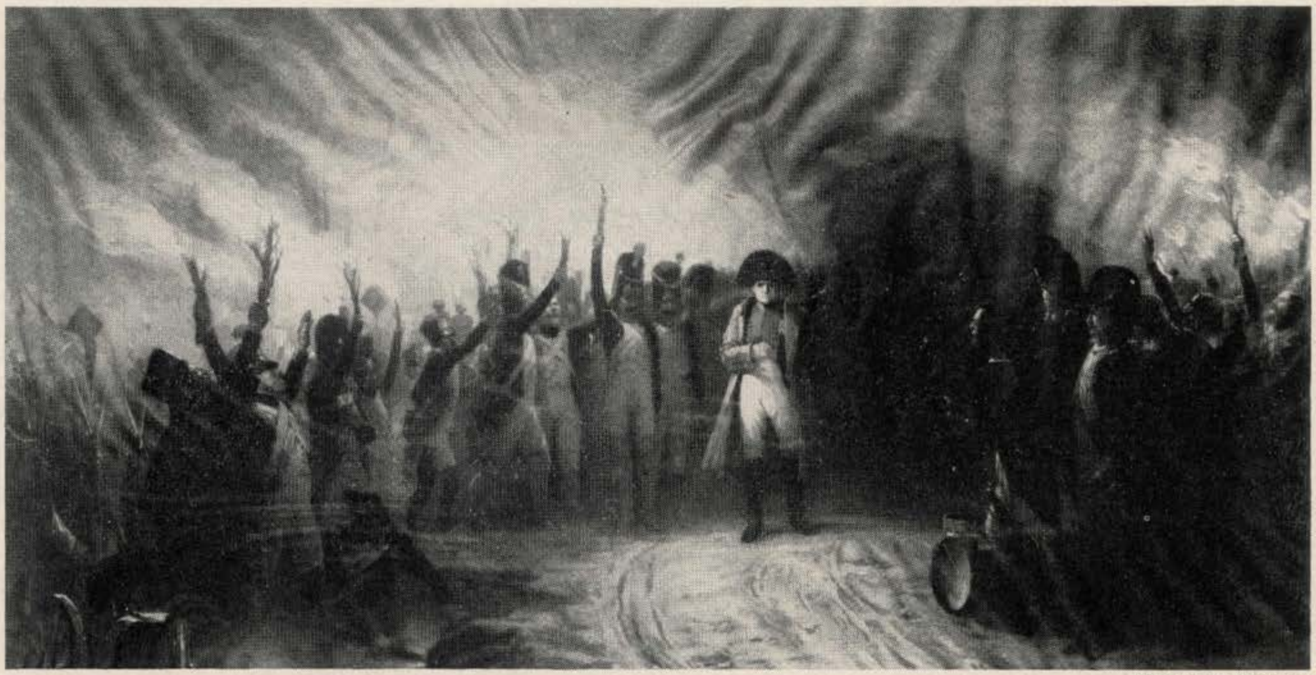
2. Second Day

a. *Morning:* The platoon attack will attack a limited objective and upon seizure of the objective, the platoon will be required to defend against a counterattack. The platoon will withdraw under pressure and conduct a counterattack; ending the tactical phase. The platoon will be opposed by aggressor troops during all phases of the tactical exercise. Blank ammunition and pyrotechnics will be utilized to add to the realism.

b. *Afternoon:* The platoon will then move to the small arms range where all individual weapons will be fired on the standard course. No alibis of any nature will be allowed. At the completion of the firing the platoon will once again receive a detailed inspection similar to the inspection at the beginning of the test. This will complete the test.

Several factors which have not been mentioned are the radio procedures, resupply of ammunition and POL and the driver maintenance during the test. In short, the test should thoroughly test all phases of a tank platoon's operation, and the platoon which emerges as the winner will deserve the Armor Leadership Award.

CAPTAIN THOMAS W. BOWEN, Armor, graduated from USMA in 1948. He was assigned to the 15th Constabulary Squadron in Germany. Returning Stateside in 1952 he was assigned to the 1st Armored Division. Graduating from the Advanced Course at TAS he returned to Europe where he is Asst. G3, 2d Armored Division.



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In the final analysis, we must agree, it is easier to die for a commander we love than for one for whom we only exist.

THE EAVESDROPPER

By CAPTAIN GEORGE S. PATTON

Socrates, Frederick, Wavell, Pershing—these are only four of the hundreds of great names who have contributed to the study of leadership. The material available for such a study is inexhaustible. The recorded thoughts and writings of the great and near great on the topic of leadership have continued, throughout the years, to draw the careful and enthusiastic attention of the truly professional soldier. Why? Simply because the secret of success, particularly in battle, is certainly directly connected with this fine art.

But what of the unrecorded?

Similarly, in our regular, everyday conversations among ourselves, or the inescapable "bull session," the subject of leadership continues to enchant us.

Among the memories we treasure, the experiences we have had, and the commanders we have known who are often the causes of our memories and experiences, it may be well to pause in order to reflect on them objectively. Perhaps it is possible to profit as well from these military souvenirs of recent nature as from the carefully prepared writings of either a Rommel or a Turenne. Against the background of selected military reading, may not examples of leadership techniques, from our own experience, assist in pointing up, sharply, a number of the keys we seek?

Let us eavesdrop, for a moment, on the conversations of three various groups of soldiers, all of whom are speaking about one leader of our time. We shall hear him discussed as we, in the past, have discussed others like him in hopes that our knowledge of successful leadership methods and techniques might be improved.

In a dark and smoke filled gasthaus in the famous old German town of Frankfurt, two noncoms were sitting, one across from the other, in a booth just off the crowded dance floor.

One could tell immediately from the equipment on their chests and the stripes on their lower sleeves, that they weren't just average men. They had the look of "pros," regulars—men who had been in battle, men who knew their job. They were armored soldiers and probably rated with the best around. They gave the immediate impression of being men who had that ingrained feeling for heavy equipment coupled with rapid movement. They looked as if they would be able to tell from the abnormal sounds of a sputtering engine which magneto was out of time. They were men who knew track tension, gunnery, firing positions and vehicle recovery. Truly, they gave the appearance of being what every young armored lieutenant dreams of having on his first assignment—learned armored soldiers—tank platoon sergeants more than likely.

"Wal I see he finally made it," said the short redhaired Master Sergeant, who had a slight stoop to his shoulders and wore a cluster on his Purple Heart. "There'll be no stoppin' him now." The man had a definite West Virginia twang to his voice.

"Yeah, I wonder how they were able to get him so high up. He's pretty junior, y'know, but a real pistol." The speaker was a tall, curly-haired Sergeant First Class, who wore a 1st Armored Division patch on his right sleeve.

"Shore, a great soldier, yes sir, and a maker of soldiers too. He was always tuned in on the problems in barracks. Always seemed to be on the troops' frequency. He understood our ways—thought we were OK. He was rough as h - -l too, but good, just plain good all the way.

"Never met a trooper who didn't like him, did you? Why was it? Most outfits I've been in, there's always somebody who can't hit it off with the old man.

"I dunno; 'Course I've thought an awful lot about it, and I reckon it was just plain professional know-how. It seems to me that he knew where to start lookin', and I reckon he knew how to pick his people," said the SFC.

The Master Sergeant pondered a minute, reflecting on what he was going to say, took a sip of beer and went on.

"I said he knew how to pick his people. Well, that's so, sure, but besides that, he also knew how to develop some of 'em who were not so hot at the start. He could always get an awful lot out of his men—never saw it fail. I don't think he ever had a man working for him who didn't lay it on the line. The funny thing about it was, he *trained* 'em to do that. I ought to know—he done it with me! Know what I mean?"

"Shore do," replied the SFC. "I remember. But don't forget, he knew how to get rid of guys. H - - l, a lot of the time it was 'shape up or ship out.' Remember that day on maneuvers in '49? I was beginning to wonder who was gonna be next. Just like one of those old time epidemics, it was.

"Now that you've got me to figuring about it too, there was a lot of other things he used to do that made us into the best. Remember, it was mostly them small points he got vicious about—you know; the dirty telephone; a corroded control box; a couple of bent rounds; poor headspace; a lousy fire command; stuff we never thought mattered a d - - n bit 'til he showed us how it did."

The little West Virginian laughed. "Yes sir, never knew there was so much to this 'death wagon' business 'til he tied into us on one of his 'strolls' thru the motor park. H - - l, he was everywhere, too. Chapel, hobby shop, hospital, PX. Always had a word to say about every place and everybody—knew everyone on the post and liked to see 'em."

"That's right," the tall SFC answered. "That's something right there. Most of 'em liked to see him, too. He was tops for my money. If he whistles, I'll come a 'runnin.' I'm shore glad they raised him a grade."

The two soldiers finished their beers, called for the check, paid up, and walked out into the darkened street.

And how would the student of military art record the points? Well, here are a few for the book. Professional ability; knowledge and appreciation of the position of soldiers; the ability to get average men to produce superior results —and make them like it; insistence on technical perfection; cleanliness (perhaps the guideline of armored maintenance), maintenance of all things; the ability to develop devotion from subordinates. These points, in essence, were what two senior noncommissioned armored leaders had recalled in their discussion of a man. These are the characteristics which they had carried with them through the years. But as we move on, we see the picture taking shape.

* * *

It was about 1015 in the officers' Coffee Bar at Fort Reality. Most of the officers had finished their morning cup and returned to their various tasks. However, two late arrivals, deep in conversation, still remained.

Both officers at the table were good solid army types of, we might guess, five to ten years commissioned service.

They had, it appeared, done a little traveling, perhaps some fighting, and looked as if they knew the score. It was obvious that they were talking "shop."

The taller of the two, a captain with bright, piercing eyes, was speaking. He wore the armored insignia, and had, as additional equipment, the patch of one of our World War II Armored Divisions affixed to his right shoulder.

"You know, I got a little fed up last night when one of the officers was complaining about the quarters situation he would be facing at Carlisle. Gosh, when you're picked to go to the Army War College, seems to me you've got no kick coming."

"That's right. Tom," said the second officer. "That was certainly not *his* approach. He told me that he would be so delighted with the opportunity to learn more about his job, that he would gladly live in a tent in order to attend."

"Now what about that, Jim," the short swarthy one was speaking. "Isn't that a novel approach, one you don't hear

CAPTAIN GEORGE S. PATTON, a 1946 USMA graduate, served in Europe with a Tank Battalion. After attending the Advanced Course at Knox and serving a short tour there as instructor he was assigned to a Tank Battalion in Korea while hostilities were still on. Returning Stateside he was assigned as a tactical officer at the Military Academy and is now en route to the United States Naval Academy to serve in a similar capacity.

too much these days? H - - l, he's always been that way, ever since I've known him—since Normandy."

Jim replied, "Sure, of course that's true. Completely and utterly devoted to the service, with no apparent signs of the old 'what's-in-it-for-me' approach; selfless to a turn. It's pretty refreshing to talk with an officer, rank notwithstanding, who works for the *Army* and thinks about what the *Army* is doing and what it is coming to, instead of himself. Too many men waste their energy and ability on improving personal position, often at the expense of the unit mission, and more seriously, the Army and the Army effort. You see it every day, from the requests for reassignment to the whitewashing of obvious command failure. I think this approach drives a lot of good men out of the service.

"But Tom, I can remember so many things that bear *him* out as a rare type in the Army. For instance, the time he took the official rap for the fellow who got crushed by the tank at the blockout detraining exercise. And how about the speech on church attendance, which he followed up by personally leading the choir?

"That reminds me of some things, too. I'll bet you'll never forget the night before the Theater Command Maintenance Inspection when he came down to the companies and drank coffee with the mop detail, I guess it was 0200. I remember he told old Sergeant Jones that his company would be gigless in the morning.

"Did you get any gigs, Tom?"

"Hell no," Tom answered, almost insulted, "How could we after that? We stayed up the rest of the night to make it perfect. I think the troops figured that they would be letting him down if they got a gig or two. He had a tremendous amount of faith in them. Personally, I feel that this was one of his prime characteristics."

"Then there were a lot of other tricks," Jim went on. "The maintenance pennants for outstanding performance; the platoon softball leagues; the example he set by banging in his own track connectors at Pfaffenhofen; the organization day parties with the old fashioned glass-breaking toasts; the maximum effort range seasons; the three day passes for the Company Commanders when it was over"—

"The time he cried when he left the Battalion, the eyes right with the tank turrets, his warm approach to soldiers," Tom had interrupted.

"How about the way he inspected? It always seemed to me that he had an uncanny ability to catch you on the items you hadn't checked, like—oh, I don't know—a radio off frequency or a supply locker full of excess. You couldn't keep a bit of excess in that outfit—ever.

"Remember the campaign against scrounging? That business paid off for me in Korea, because I had been trained to enforce it. Because of that, we were able to establish some sort of usage factors with Division which everyone could rely on and refer to when we had to move the unit. We knew how many oil coolers we were going to be needing, for example, because we had been working through channels regularly, and Ordnance was familiar with the problem. It certainly got the proper results, and at a critical time."

Jim answered, "Right; he's a pro, a real pro. He knows his stuff and he knows where to put the emphasis in preparing a unit to do a job. This helped me no end with my outfit later on when we were playing for keeps."

"Say—I hear they promoted him the other day. I was pretty pleased to see that."

"Why, Jim, what else? They couldn't pass him by."

"Well, Tom, enough of this, really. It's a lot of fun to sit here and talk about old times, but we'd better get back to work."

We are able to make a few more notes. What was it they said? Oh yes. Devotion to duty came up again, and now an indication of some moral courage and loyalty—to a subordinate too, mind you. Citizenship, and genuine interest in a group effort. Not always just "Do it," but often varied with "Do it, I'm with you. I have faith in you." Development of the competitive spirit toward a better unit; setting the example; professional ability and knowledge of armored or mechanized problems, in order to build a good solid foundation for tougher days ahead.

The soldiers and the younger officers have spoken and, thus far, the results have been fruitful. But we need to round out the problem and, to do this properly, we must invade the privacy of general officer rank. After all, are they not the successful ones and hence the most competent judges? This is certainly logical. Anyway—.

To put it mildly, the office was spacious. The large mahogany desks, charts and pictures on the walls indicated the inner offices of, at least, a three star general. Footsteps sounded in the hallway, and an officer entered. He was a tall, distinguished appearing soldier, wearing the three stars of a Lieutenant General. As he strode into the office, into the inner sanctum, where it was possible for a man under the tremendous pressure of great responsibility to relax and be alone with his thoughts, he looked quite tired and perhaps even depressed. He was talking to himself.

"Well, that's over," he sighed, "That's well good and over. A couple of hours more of that kind of bunk and I'd be ready for the I & C List. Wonder what the Journal has to say today."

Picking up a copy of the Journal he began to read intently.

"Let's see, now. Who made it? Jones, Smith, Jackson—oh, oh—another dentist." A brief pause and then, "Ha! Well, what do you know! That's fine, just fine." He began to straighten up. "John," he called. "Come in here a minute, will you?—Right away."

The footsteps outside in the corridor announced the approach of another general, a two star this time, who entered the room carrying a packet of papers marked "SECRET" under his arm.

"I'm sorry, sir, I thought you'd gone home already. I didn't hear you come in," he said.

"No matter," said the elder man, "I just dropped in for a quick breather before that shindig tonight. John, look at this, will you? They finally promoted him. He made it."

"What are your ideas on it, General? You've known him a long time. How did he do it?", the younger man was asking.

"My ideas? Ha! I'll tell you my ideas. They're pretty simple, that's all. Basic—elementary! First of all, he's a professional fighting man, an artist at soldiering—knows his job. He has, truly, a real love and a human touch for soldiers and much faith, thank God, in what they represent. He's loyal to his people and he has both moral and physical courage. Another thing, he's humble. You probably don't see that, but I do, because I've known him since he was a lieutenant. He's a true patriot who loves his country, and, I might add, a moral, God-fearing citizen. There's much character there."

"Another thing, General," exclaimed the younger officer. "In my opinion, he sets the example. He can be rough and hard and even ruthless at times, but still, all ranks love him and are drawn to him. They really want to be around him. You can see it at parties. He always seems to find time to talk to subordinates, find out their ideas and respect them. This is a very rare trait, especially these days."

"Yes, John, that's right. He's not, actually, the cold, calculating type at all. When you come right down to it, only a limited number of the really great commanders in history were. The truly great leader, in my humble opinion, inspires pride in his unit and devotion to all things, particularly himself. Perhaps you're born with it, I don't know. But the intangible ability to inspire devotion in one's subordinates is a tremendous advantage to the commander. After all, these subordinates are the ones who make or break us in the end. 'Men follow a man, not men.' Who said that, John?"

The major general stroked his chin thoughtfully. "I'm not sure, sir, but I believe it was Napoleon who made that statement."

"Well, whoever said it was dead right. The statement applies today, too, just as it will tomorrow and one hundred years from tomorrow. It's funny, isn't it, how little we really change in our concept of the markings of a leader?"

The subject changed. Matters of immediate importance were taken up between the two distinguished gentlemen, and as they became more deeply engrossed in the operational requirements of the command, it became evident that the discussion on leadership had ended. Let us list a summary of their comments.

We notice, immediately, that the word, *professional,* seems to crop up for the third time, *professional ability,* to be specific; *knowledge and affection for soldiers, loyalty,* and now we see the word *humble* entering into the conversation. *Patriotism* and love for God and country are also mentioned.

Are these "flag waving" terms associated with leadership and the art of leading? Apparently the generals think so. Character? Certainly there is a place for it. We see *example, personal magnetism,* and, once again, almost monotonously regular, *devotion* to and from the subordinate.

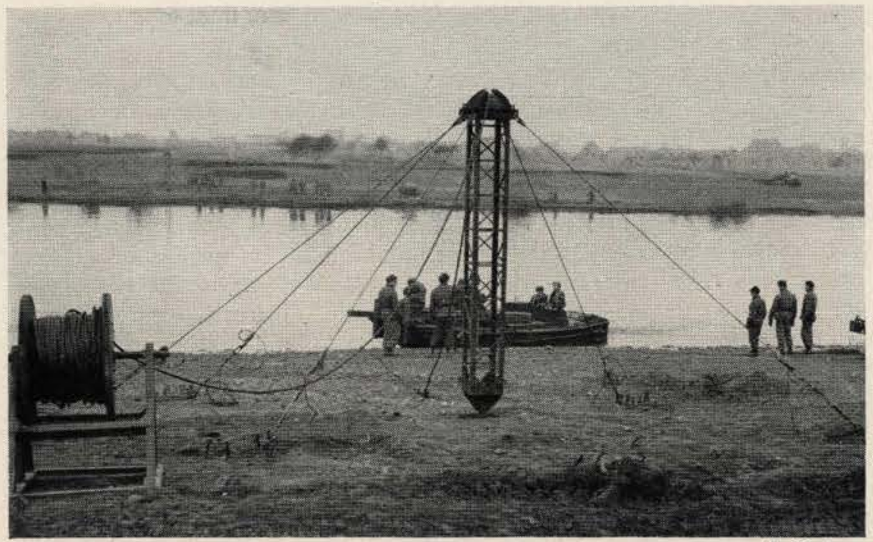
It is more than likely that the power of personality in the great game of war or, as at present, in the preparation for war, is no small caliber weapon to be reckoned with. It is sometimes forgotten, too, as Scharnhorst brings out when he says that "in long periods of peace, mechanical thinking triumphs over the qualities of the heart and soul." However, we have seen through these short conversations, time and again, that the personality is, perhaps, the motivating force, for, in the final analysis, we must agree that it is easier to die for the commander we love than for the man for whom we only exist. It follows, then, that the subordinate will run more risks and face greater hazards in the former case. When this is accomplished, the chances for victory, *especially when the outcome hangs in an even balance,* are materially increased. In such situations, the risks taken and additional dangers faced may tip the scales of fortune in favor of the leader who faces them. As we can derive from history, this is especially true in mobile warfare where, often, the quick decision and correct battle reaction involving tremendous risk of death or maiming has saved the day.

It is thus we sketch the leader. Names and grades attained are not mentioned since these points brought out may fit several grades and, we hope, many names on the Army list. In the final analysis, the salient points of these recorded conversations about a leader may be summarized in three familiar phrases which have graced many a training aid and been written on hundreds of blackboards. Often lost in the maze of words in a student's notebook, they may come alive for us and approach full meaning when associated with a living example. The terms are not new; we merely rediscover them from time to time. From the coppery veterans of Xenophon to the tenacious poilus before Verdun; from the ranks of Stuart's troopers to the dusty tank crews of Panzer Army Afrika, the vital truth of their meaning has been passed on. Their echo is so strong, their message so true and enduring, that we know they will be destined for the spirits of soldiers yet unborn.

"Show us that you know your job."

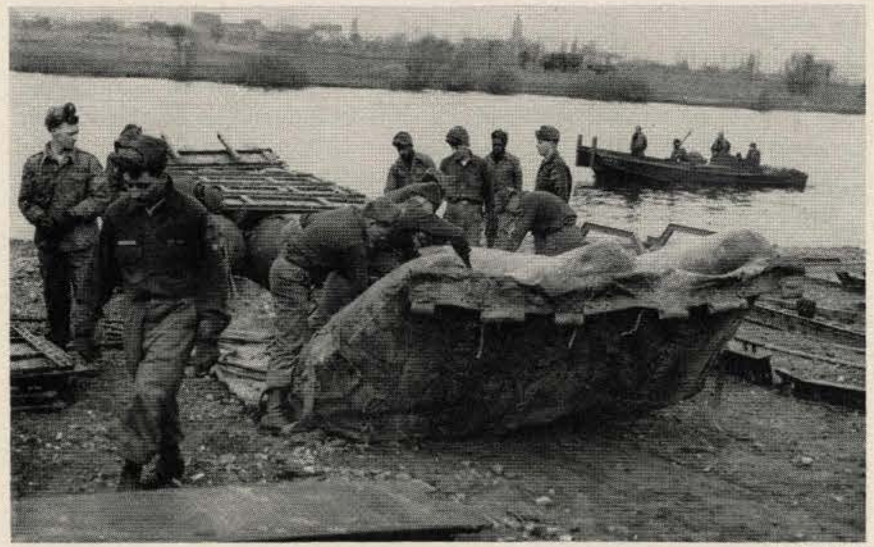
"Show us that you know and love your men."

"And in our turn, we will follow you to the ends of the earth."



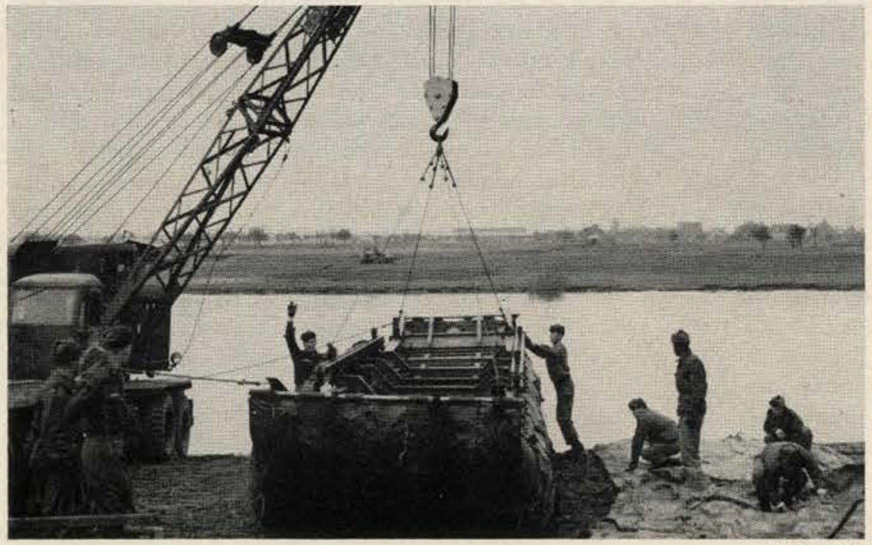
U. S. Army

Crossing site after bridge centerline and anchor cable towers were completed.



U. S. Army

Inflating front section of the 20 ton float as saddle panels are positioned.



U. S. Army

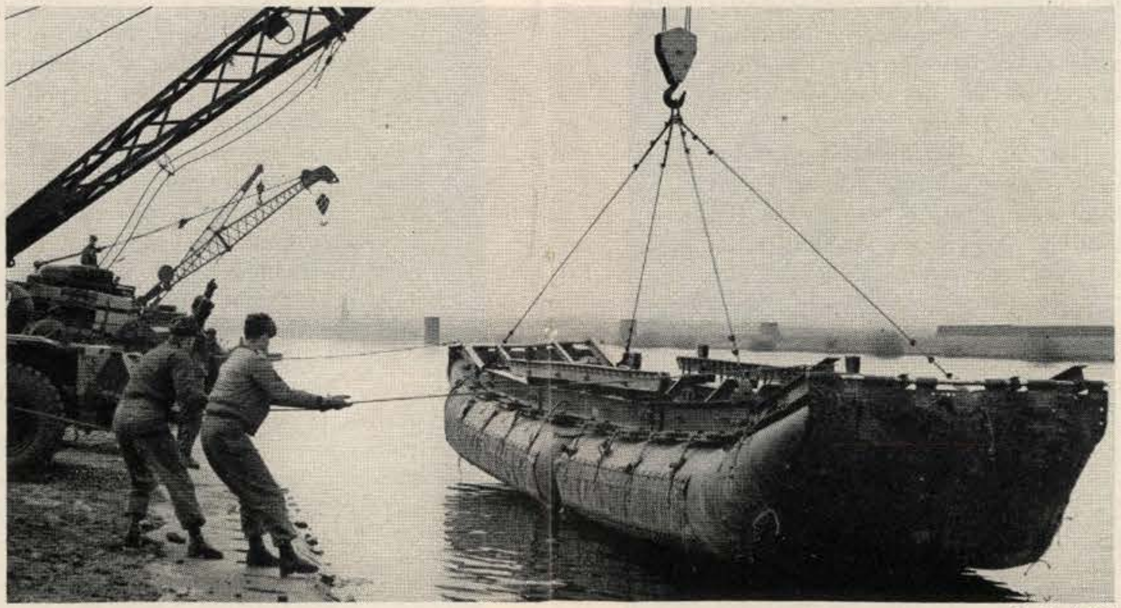
The first float completed 17 minutes after signal to start building was given.

U. S. Army

Men position saddle beam upon the saddle panels in preparation to launching first float of the bridge.

ARMORED ENGINEERS IN ACTION

The Army's M4T6 Floating Bridge is a combination of hollow aluminum decking from the M4 Floating Bridge and 20-ton rubber floats from the class 60 Floating Bridge. The bridge is constructed by inflating the 20-ton floats and assembling four such floats to support a length of roadway. The road portion has hollow aluminum decking in the deck and raised guard rails along each side. The completed sections are floated into place, one being connected with the other until the span is completed. A secure cable system holds the sections in place until the river is spanned, then they are firmly anchored. This pictorial story depicts the 2d Armored Division's 17th Armored Engineer Battalion putting on this special bridge building demonstration across the Main River in Germany.

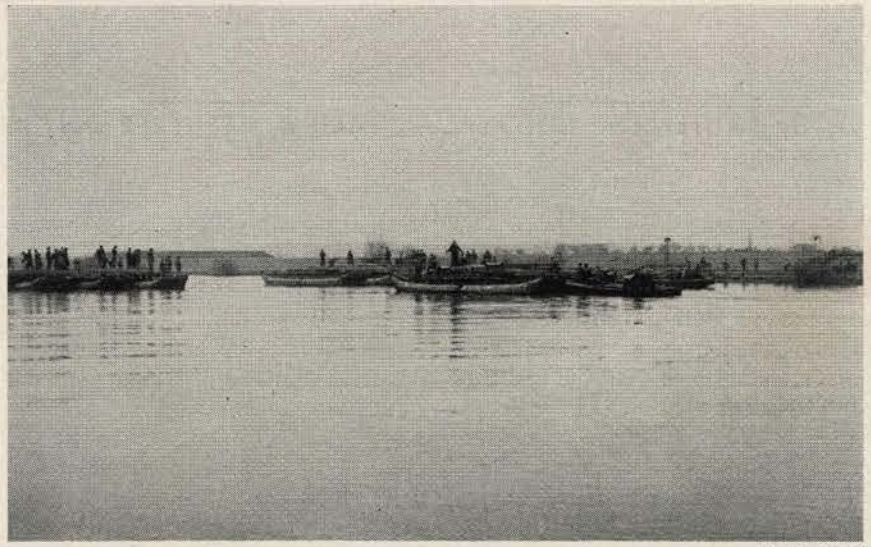


U. S. Army

This photo shows the men in the act of launching the first float in building the M4T6 Floating Bridge.

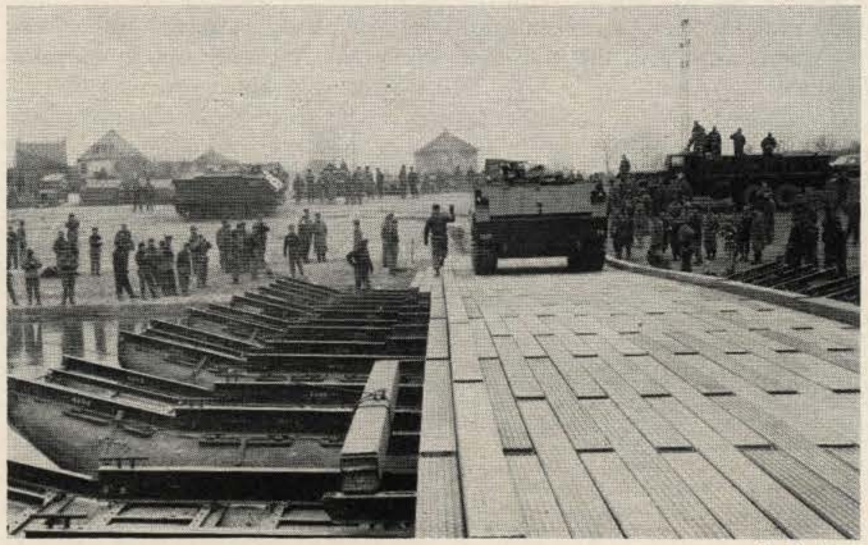
U. S. Army

This view shows the men as they are completing the near shore end of bridge.



U. S. Army

The last float is being brought into its place prior to the closing of the bridge.



U. S. Army

The first APC starts across 2½ hours and 348 feet after the start of bridge.

The following three articles about the 3d Armored Division were written by members of Division Artillery, an Armored Infantry Battalion and an Armored Engineer Battalion. These articles on training will be beneficial to all Armor units inasmuch as they show the intense preparations that went into the Division's training problems. The Division is now in Europe as part of the NATO defense of Western Europe.

DIVISION ARTILLERY TRAINING PR

By *LIEUTENANT COLONEL RICHARD B. KREUTZER* and *CAPTAIN ROBERT C. McALISTER*

ON 8 February, 1956, the 3d Armored Division Artillery successfully completed a two day exercise during which the fires of all battalions were massed with great effect on both observed and surprise targets. To the men of the Spearhead Division's Artillery, from DivArty Commander Brigadier General Alva R. Fitch on down, this represented the pay-off of a six months training program which was as compressed and intensified as any ever attempted by a unit in peacetime. The results of this training were, in the words of the Second Army Commander, "unprecedented in the peacetime history of our Army."

To understand the necessity for this compressed training program and the compelling urgency which underlined its execution, it is necessary to briefly review the mission of the 3d Armored Division and the time which was allowed for accomplishing this mission. The division was activated on 14 March 1955 at Fort Knox under the command of Major General John M. Willems, whose mission, simply stated, was to prepare the division to assume its full share of the defense of Western Europe by the time it completed a Gyroscope transfer to Germany in May 1956.

The enlisted cadre began arriving in April and was virtually complete by 15 May. Most of the cadremen had no previous armored artillery experience. A cadre training program was devised which consisted of two principal parts: local training while awaiting the arrival of fillers and secondly, an intensive service school program. Filler personnel began arriving in June and continued to arrive in small groups until the end of September. These personnel came direct from reception centers and had received no training before joining the Division.

Keeping in mind the mission of the Division and its relationship to the dates which limited the accomplishment of this mission, the necessity for compressing the normally prescribed training programs can be clearly seen. Mid-August may be taken as the average arrival time for filler personnel; the requirements for processing personnel and equipment for overseas movement dictated mid-February as the end of sustained unit training. The problem, then, was to take about 3,000 untrained men, give them basic combat training, make soldiers out of them, and mold them into units in approximately six months. These units had to be made combat ready by the time they started their overseas processing; this required not only unit training but combined arms training as well, so that they could operate as part of the Division.

The Army Training Program for basic combat training is based on an eight-week training period, and the training program for Artillery units is twenty-one weeks in length. The

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LIEUTENANT COLONEL RICHARD B. KREUTZER, Artillery, graduated from Colorado State College. During World War II he served in Europe in various capacities with the 56th Field Artillery Battalion. Subsequent to the War he served in the 8th Infantry Division and attended The Artillery School and C&GSC. He was assigned to the Pacific where he was in the Supply Division, FECOM. He returned to the States and instructed at C&GSC from 1952-1955. Since then he has been S3, 3d Armored Division Artillery.

CAPTAIN ROBERT C. McALISTER, Artillery, graduated from USMA in 1945. He was assigned to the Constabulary in Germany. Returning Stateside he was assigned to the 10th Field Artillery Battalion. He accompanied that unit to FECOM in 1950. He returned home and attended The Artillery School and was assigned to the Board at Fort Sill, Oklahoma. Completing C&GSC in 1955 he was assigned Assistant S3 of the 3d Armored Division Artillery, his present position.

GRAM

U. S. Army

This unit is a 105mm self-propelled Howitzer, highly mobile element of the 65th Armored Field Artillery Battalion.

Artillery battalions had to achieve the equivalent of this twenty-nine week program in approximately twenty-two weeks, while at the same time participating in a sufficient number of combined arms and higher unit exercises to permit them to operate effectively as a part of the Division. These exercises averaged about three training weeks per battalion over the training period. Achievement of the training objective could only be met by reducing each training phase to a minimum, taking maximum advantage of integrated training in the latter phase to make up deficiencies of earlier training phases. The training program evolved for Division Artillery consisted of three phases: basic combat training, six weeks; basic unit and advanced individual training, ten weeks; advanced unit training, six weeks. The three weeks of combined arms exercises came generally during the advanced unit training phase.

As anyone who ever participated in it can verify, there is very little "fat" which can be cut from the eight week basic combat training program. Any subjects omitted or slighted must be integrated in later training, otherwise serious training deficiencies will occur among individuals. This fact was considered in reducing the training time for this phase from eight to six weeks. Specific subjects which adapted themselves to unit training were either deleted from the basic training phase or drastically reduced; other subjects were covered fully. Particular emphasis was placed on those omitted subjects in basic and advanced unit training. Basic subjects which were found to be suitable for integration in unit training phases either wholly or in part included some dismounted drills and ceremonies, inspections and commander's time, physical training, anti-infiltration and guerilla training, battle indoctrination, hasty fortification, mines and booby traps, techniques of fire, defense against aircraft and Armor, and squad tactical training. The arrival of fillers in small groups (typically a battery would receive nine or ten men in a week's time) added an enormous burden to the basic training problem, since it was essential to get men into training as soon as possible after their arrival. This problem was further complicated by the absence of many cadremen at service schools. These two factors, the dribble of replacements and the shortage of instructors, caused the adoption of a modified committee system in many cases.

Advanced individual training, normally of seven weeks' duration, and basic unit training, a six week phase, were integrated into one ten week training period. Maximum effort was directed toward concurrent development of individual skills and effective firing batteries. During this phase each light Field Artillery battalion conducted two training periods at Camp Breckinridge, Kentucky, a satellite post of Fort Knox which is 150 miles distant. These training periods, which averaged two weeks each in duration, were invaluable both because of the tactical training accomplished and the rapid growth of battery and battalion *esprit*.

The end of the basic unit training phase was marked by battery tests, conducted by Division Artillery. In conducting and grading these tests, no consideration was given to the abbreviated training cycle, and the fact that all batteries successfully completed the tests is an index of the effectiveness of the basic unit training phase.

There could be no let-up in the tempo once the battery test hurdle was passed. Advanced unit training, although it was scheduled over a six-week period, actually consisted of only three or four weeks of Artillery training time which could specifically be called advanced unit training. As has been noted, the remainder of the time was devoted to combined arms exercises. During this phase Artillery support was furnished to every Tank and Infantry unit test, from platoon to battalion. This support varied from a single forward observer section in platoon tests to an entire Artillery battalion and an Antiaircraft battery in support of Tank or Armored Infantry battalion tests. In addition each battalion participated in a Combat Command level field training exercise.

Except for the Antiaircraft battalion all advanced unit training was conducted at Fort Knox, and congestion of the limited areas suitable for artillery firing added a new complication to a training situation which was already difficult in the extreme. The problem of congestion was overcome, insofar as possible, by closely controlled scheduling of the limited areas available in order to insure their complete use when they were available to the Artillery.

During the advanced unit training phase, due to combined arms training commitments, battalions were able to conduct an average of only two firing practice battalion tests. The battalions were faced on the one hand with test dates which could not be postponed and on the other by a lack of space as previously indicated. The problem was attacked by the battalions with great ingenuity and energy. Various methods were used to squeeze blood out of the training turnip. At every opportunity battalions moved to bivouac areas near the firing ranges in order to cut down on travel time and make the most of each firing day. Firing was integrated into supported unit tests, command post exercises and other exercises whenever possible. Stripped down elements were taken to the field to exercise survey and fire direction sections when other commitments precluded taking a whole battalion to the field. Near the close of the training period for each battalion and just prior to its battalion test, Division Artillery conducted an umpired test using the same grading scales, check lists and procedures as would be used on the actual test. Immediately following the practice test the umpires conducted critiques pointing up deficiencies and making recommendations for improved performance.

Tests for the Field Artillery battalions consisted of two parts. In the first part, the battalion occupied an initial position on the day preceding the test. Early the following morning the battalion was required to displace and deliver fire rapidly on several targets of opportunity. During the course of the day various gunnery problems were solved by the battalion including registrations, massing the fires of the battalion, adjustment of fire by an aerial observer, surprise fires, high angle fires and others. Early on the morning of the second day a deliberate reconnaissance and preparation of position was carried out. This was followed by a night displacement. During the night and the following morning various missions were fired to test the unit's ability to deliver surprise fires, fire TOT missions and conduct other advanced phases of Artillery gunnery.

Throughout the conduct of the tests various Aggressor actions were conducted against the battalion including a guerilla attack, an attack by a tank platoon and CBR attacks either in conjunction with one of the other attacks or separately or both. The pattern of these attacks was varied from test to test in order to test the ability of the units to react to tactical situations when surprised.

An additional, and uninvited, training test was the weather. Only one thing about the weather was consistent—it was always bad. Soldiers who had been civilians six months before responded like veterans to the challenge of test and weather.

As in the case of the battery tests, units were graded without consideration of the reduced training period and again the test results were an indication of the training achievement. All battalions passed each part of the test in a manner which clearly demonstrated their ability to move, shoot and communicate.

The Antiaircraft battalion conducted firing exercises at Camp Stewart, Georgia in two-battery increments during its advanced unit training phase. The rest of its tactical, detection and tracking training was done at Fort Knox. The limited availability of jet aircraft, and the further restrictions on their use imposed by the weather, complicated the detection and tracking training. On the few days when aircraft were available and the weather cooperative, training in detection and tracking lasted from daylight to dusk. The Battalion test of the Antiaircraft Artillery battalion was conducted in two parts; all firing was, of necessity, conducted during the training period at Camp Stewart. The firing test consisted of Antiaircraft firing only; range limitations precluded surface firing. The non-firing phases of the test were conducted at Fort Knox. These phases of the test began with the assignment of an Antiaircraft defense mission to the battalion. Following a daylight reconnaissance, the battalion made a blackout march and night occupation of the defended area. The detection, by radar and ground observation posts, and tracking phases of the test were conducted in this defended area. Again the availability of jet aircraft was a problem; due to weather during the test period, light aircraft were used. During the entire period of the test Aggressor harassed the battalion with infiltration, guerilla, CBR, and atomic attacks. During certain periods the radar set and radio nets were jammed. The battalion passed both phases of the test with flying colors.

All battalion tests, other than the firing phases of the Antiaircraft battalion test, were conducted and umpired by Division Artillery. Thorough umpiring of the tests meant an almost complete commitment of the headquarters plus an augmentation of umpires from the other battalions. This requirement was an additional strain on battalions which were still practicing for their own tests.

The Division Artillery firing exercise has already been mentioned. This exercise, which might be called a graduation exercise for Division Artillery training, was designed to test Division Artillery's ability to mass its fires, to deliver surprise fires and to conduct TOT missions. In addition, night adjustment of fire under Artillery illumination was included. The exercise was conducted under fully tactical conditions, and included Aggressor ground and air action, the latter a low level attack by jet aircraft. Observers adjusted fire from ground and air observation posts. Full use was made of both wire and radio communications by special communication exercises which were introduced into the play. Survey requirements were such as to present a real challenge to battalion survey parties. The meteorological section of Division Artillery furnished continuous information to the battalions; weather corrections were applied with good results during the firing. Senior commanders and staff officers were able to observe the firing from several control observation posts and so control the firing that maximum training value could be derived. This exercise symbolized the entire training program—every possible training activity was compressed into the limited time and space available.

Some conclusions as to the effectiveness of the accelerated training program which has been described in these paragraphs must be deferred until a later time. However, certain other conclusions may be drawn now, while the lessons learned are still a matter of recent memory. The first, and foremost, conclusion is that an accelerated training program is possible, it will work, and it will create relatively well trained units at a considerable saving in time. The second conclusion might be termed the other side of the coin; in cutting time from an already compressed training program "something's got to give."

The conclusion that this training program will produce effective units at a substantial saving in time appears to be proved by the observations of senior commanders, staff officers and observers from higher headquarters who have observed these units in action, undergoing tests, and in garrison. Several factors played major parts in making the program a success:

> *1.* First of these, as on any list, is *leadership*. Dynamic, driving leadership was an essential, particularly at the section and battery level, in order to keep the units functioning at required efficiency.
>
> 2. Another factor which affected the results was the *maximum use of space and time*. Every day and practically every hour must be well used or the result will suffer. Lack of unrestricted training area was a severe handicap, overcome to some extent by the means described, but never completely.
>
> 3. The training area should include *ranges for firing all weapons of the division*. The 3d Armored Division was able to send antiaircraft crews to Camp Stewart, Georgia for firing training; however, the necessity for sending the battalion to the firing area in two-battery increments meant that the battalion had only about one week during its advanced unit training phase to train as a battalion.
>
> *4.* The *maximum use of service schools* played a key part in this training program. In the early stages cadremen made up the school quotas; after basic training the students were usually filler personnel.

The "something which had to give" was a certain degree of individual polish. Intensive efforts were made at each stage of training to correct this. However, individual, and, to a much lesser extent, small unit deficiencies still appear. A program of review and testing is currently aimed at eliminating these deficiencies. Such a program is only possible where the incoming soldier stays in the same unit from basic training through unit training.

This abbreviated description of an abbreviated training program has not been written with the purpose of selling a new idea or recommending changes to existing training programs. It is simply intended to show how one unit successfully faced the problem of achieving operational readiness in less than the "normal" time allowed.

U. S. Army

After having received intelligence reports from G-2, a fire mission is planned.

ARMORED INFANTRY BATTALION

Training Tests in the 3d Armored Division

By MAJOR RAYMOND M. RIGGSBY

"The true end product of training and testing is—What have you learned? We learned our areas of weakness and what to do to eliminate them. These tests drove home what we needed to know. Upon completion of the tests our Armored Infantry had truly earned full-fledged membership in the mobile fighting teams of the Third Armored Division."

THOSE of us concerned with training the Armored Infantry Battalions of the 3d Armored Division, with a view of making them combat-ready for their Gyroscope mission, were confronted with a problem of compressing into 21 training weeks all of those subjects required by the pertinent Army Training Program to which 28 weeks are normally allocated. Our dilemma was eased somewhat by holding in abeyance the prescribed physical training program until subsequent to the scheduled date of "equipment turn-in." (This course of action is strongly recommended for future Gyroscope units which may also be required to accelerate their training programs.) The overall problem of telescoping the required training into 21 weeks would ordinarily have been

U. S. Army

The Commanding Officer of an AIB explaining the deployment of his troops.

U. S. Army

Keep on coming—is the "high sign" as an M59 moves into a tactical position.

MAJOR RAYMOND M. RIGGSBY, Armor, served in Europe with the 1st Armored Division during World War II. He received a battlefield commission in 1943. Subsequent to the War he attended The Armor School and was assigned to the Board at Knox. After an assignment to the 3d Armored Cavalry Regiment he was assigned to a Tank Battalion in Korea where he received the D.S.C. Attending the Advance Course at The Armor School, he instructed there prior to his present position as S3, CCC, 3d Armored Division.

simplified and facilitated by the fact that AR 220-20, which covers units about to Gyroscope, does not require that the units be tested prior to overseas movement; however, our freedom of action here was definitely inhibited due to the fact that in the 3d Armored Division we were required to *train* and *test* our units within the 21 week limitation. Thus it was that we approached our planning task with mixed feelings. However, had we known then what we know now, our reaction would have indeed been more enthusiastic. What we learned from this training situation, in simple terms, was this: Army Training Tests, properly administered, are the most valuable training vehicles that can be devised; in addition to checking the combat readiness of a unit, they build individual confidence and *esprit;* to make a training test more valuable as a training vehicle, umpire personnel must be of the highest caliber; the critiques must be continuous; and the unit should be equipped as nearly as possible in accordance with its TO&E authorization. Also, training tests should be progressive insofar as available terrain will permit. The tests administered to the "Spearhead" Infantry elements progressed from a simple two phase platoon test through company and battalion tests and culminated in a five phase Combat Command Field Exercise.

Our tests were all designed to determine the achievement of the following primary training objectives:

1. The true status of "unit training."
2. The unit's "combat readiness" as evidenced by its performance under simulated combat conditions in its primary roles and missions.
3. The proficiency and efficiency of the unit's command, staff, logistical procedures and SOP's.
4. The flexibility and reliability of communications personnel and equipment of units undergoing typical combat missions.
5. The overall flexibility of the unit under changing conditions with specific emphasis on ability to move, utilization of all means of fire support and incorporation of simulated situations of atomic warfare.

The battalion test presented herein is not claimed to represent any bright new concepts or much original thinking. It was purposely patterned after the test administered by V Corps in Europe. In addition several points were extracted from the test given stateside by III Corps at Fort Hood, Texas. The test lasted four days and three nights and consisted of five main parts. Each battalion was organized for the test in an identical fashion, *i.e.,* less one Armored Infantry company and reinforced with one tank company plus a platoon of Engineers; also, Artillery forward observers were with each company and an Artillery liaison officer was with the battalion headquarters.

U. S. Army

One of only five M59s that became mired to the point where they required a tow.

The Fort Knox terrain is no stranger to most Armor officers. The test area "covered the waterfront" from Chappel Ridge to Carlisle Church and included everything from rugged terrain and precipitous hillsides to gently rolling valleys. Old hands at Fort Knox, often remark, "If you don't like the weather, just wait a minute and it will change." This was certainly true during the course of the four tests but the accent was on adverse conditions which really presented a challenge to the tested troops. We had rain and mud for the first two battalions tested, snow and ice for the third and more rain and deeper mud for the last.

The general situation leading up to the start of the test is summarized as follows: The 9th and 51st Aggressor Rifle Divisions, which opposed the 3d Armored Division, were at approximately 60 per cent of authorized strength in both personnel and equipment. Neither the US Forces nor Aggressor had air superiority. Both sides had atomic capabilities. The 3d Armored Division which had been exploiting to the North along the axis of Highway 31W, had seized Fort Knox and was preparing to continue its attack to isolate the key communications center of Louisville. CCB, on the left, had been momentarily held up at Salt River due to blown bridges but CCC, on the right, had succeeded in crossing the barrier only to be slowed down by rough terrain and stiff Aggressor resistance. The presence of two Aggressor divisions on the 3d Armored's East (right) flank posed a serious threat to the accomplishment of the Division mission at Louisville. Therefore the U.S. Corps Commander had directed certain changes in troop dispositions and missions. The 3d Armored Division was directed to orient itself on the two Aggressor divisions to the East and then to attack and destroy them; the 201st Armored Cavalry Regiment was ordered to take over the zone of the 3d Armored Division in the

North to facilitate the Spearhead counter-move to the East.

When the 201st Armored Cavalry Regiment had relieved CCC North of the Salt River, in accordance with the foregoing, the stage was set for the tested battalion to move into its assembly area and the actual testing then began.

Part one of the test consisted of the occupation and organization of the assembly area and a 28 mile blackout march.

Part two of the test began with the issuance of the CCC defense order in the assembly area at approximately 1200 hours on D Day. The order required the tested battalion to close in its defense sector by BMNT on D+1. The battalion then occupied, organized and remained in its mobile defense position until early on D+2. (During this period the enemy situation is developed until it is apparent to all concerned that the Aggressor is attacking generally along the boundary between the 3d Armored Division and the 20th Infantry Division with a mechanized division and a tank division.) Early on the afternoon of D+2 the tested battalion is issued the CCC Operation Plan.

When the operation plan is ordered into execution, Part three, emphasizing delay and withdrawal of the test, commences. The object of this plan is to carry out the Corps and Division battle plan of drawing in and channeling Aggressor elements into an area where they will be a lucrative atomic target. The plan requires the tested battalion to conduct a delaying action, and then, on order, to withdraw through the CCC reserve elements and establish a position defense. (While the actual time required to accomplish this varied with each battalion tested, it was possible for each one of them to carry out this plan and close into their sector for the position defense by early afternoon on D+3.)

Part four consisted of the reconnaissance, occupation and organization of the position defense area and the preparation of counterattack plans by the tested battalion.

Part five, emphasizing the offense, began with the issuance of an Operation Plan by CCC which called for the use of an atomic weapon on the Aggressor troops opposing the tested battalion. Immediately following the atomic burst there was to be a resumption of the offensive in order to exploit the employment of this special weapon. The plan required the tested battalion to seize two successive objectives and prepare plans for a hasty river crossing in order to seize the third objective. Upon seizure of this second objective and when the tested battalion commander issued his order for seizure of the third objective, the test terminated.

Throughout each phase of the test there was continuous Aggressor action. The Aggressor unit was comprised of the Armored Infantry company not being tested with the battalion, reinforced with a platoon of tanks. In order that this company would derive the benefits of participating in a battalion test, it was attached to a Tank battalion during the Tank battalion tests.

Control for the tests was established by Combat Command C. In addition to a Control Headquarters, "Control" personnel and umpires were assigned down to include platoon level. Cut sheets were given to the tested unit prior to implementation of the test, to ensure detailed application of basic fundamentals at all times and at each level.

Although the extreme in weather conditions prevailed, the tested units established a very high standard of maintenance of their vehicles during the tests. Only two M59's were lost to the tested units due to mechanical failure, only five vehicles became mired to the point where they required a tow and there was only one minor vehicle accident.

The true end product of training and testing is—What have you learned? We learned a great deal. But most important we learned our areas of weakness and what to do to eliminate them. A few points where we found more emphasis was indicated are:

1. Radio procedure and communications security especially at lower echelons.
2. Cover and concealment during movement of units.
3. Resupply techniques.
4. Tactical location and employment of automatic weapons.
5. The preparation and use of range cards.
6. Dissemination of information up, down, and laterally.

An old philosopher once said, "It is a smart man who knows what he knows and knows what he doesn't know." In no uncertain terms, these tests drove home what we needed to know and each of our Armored Infantry battalions was convinced, upon successful completion of the exercises, that they had truly "earned their spurs" and were entitled to full-fledged membership in the mobile Armor fighting teams of the Spearhead Division.

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U. S. Army

A raft of a floating widened steel treadway bridge of the type constructed by the 23d Armored Engineer Battalion.

TRAINING TEST OF THE ARMORED ENGINEER BATTALION

By LIEUTENANT COLONEL EDWIN G. MORAN

THE 23d Armored Engineer Battalion Test began on 10 January, 1956. Conducted as outlined in Army Training Program 5-302, the test was the culmination of an accelerated training program, which started the third week in July, 1955. The training program consisted of seven weeks' basic training, six weeks' individual advanced training, and four weeks' unit training. The equivalent of five weeks' additional training was gained from participation in Platoon and Company Tests and combined arms exercises. The integration of additional subjects into the training program was emphasized throughout the entire training period. Divisional, Army and Technical Service Specialist School Courses were utilized extensively after completion of basic training.

The test, conducted by the Staff of Combat Command A, 3d Armored

LIEUTENANT COLONEL EDWARD G. MORAN, Corps of Engineers, attended Cornell University. He came on active duty in 1942 and served in the Pacific during World War II. Subsequent to the War he was assigned to several Engineer Depots. Following graduation from C&GSC in 1955 he was assigned as the Commanding Officer of the 23d Armored Engineer Battalion, 3d Armored Division where he is now on duty.

Division, was designed to determine the proficiency of the unit in battalion staff operations and planning, tactical motor marches, road and bridge reconnaissance, organization and security of bivouac areas, assault river crossing, construction of the M2 Widened Steel Treadway Bridge, fords and small craft airfields, demolitions of roads and bridges, mine warfare, water and Engineer supply, reports, maintenance and communications.

Missions were assigned which required the support of the Division, Combat Command A and reinforced Battalion Task Forces. The accomplishment of these missions required sound planning, rapid movement and flexibility.

The day prior to the test, the Battalion Commander, his Staff and the company commanders were briefed on the general tactical situation. Information concerning Aggressor, the Division mission and the location of units was shown. The 3d Armored Division was in Corps Reserve prepared to attack in the V Corps zone. The information was passed down to all members of each unit by the company commanders. The 23d Armored Engineer Battalion was alerted at 0730, 10 January, 1956. The troops were mustered and equipment was readied for the test beginning at that time.

At 1300, 10 January, 1956, the 3d Armored Division and Combat Command A overlay type operations orders were received. The Division Plan of Execution involved Combat Commands A and C abreast with Combat Command B in reserve. The 23d Armored Engineer Battalion less A and C Companies, which were attached to Combat Command A, was assigned the missions of preparing a liaison air strip in the vicinity of Ditto Hill to accommodate 20 L19 type planes, and maintenance of roads and bridges in the Division Zone.

The Task Organization for Combat Command A involved four Task Forces, Hungate, Kapp, Meredith and Pershall, with A and C Companies of the 23d Armored Engineer Battalion under Combat Command control, performing reconnaissance on the roads in the Combat Command zone. Each staff officer of the 23d Armored Engineer Battalion familiarized himself with the orders and formulated their recommendations for supporting the Division.

At 1430 the Battalion Executive Officer conducted a staff meeting, and plans for supporting the operation were developed. At 1615 the Battalion Commander was briefed and plans were presented by the staff members. The concept for supporting the assigned missions was finalized and the staff sections then proceeded to develop the operation and administrative orders for final approval. Warning orders were issued to all companies. A company commanders' meeting was held at 2000 at which time the staff briefed the company commanders and their executive officers on the final approved plan. The operation and administrative orders were issued at 2130. The concept of the operation for the 23d Armored Engineer Battalion less A and C Companies was to place B, D and Bridge Companies in general support of the Division. B Company was assigned the additional tasks of constructing a liaison type air strip with parking area for 20 L19 type aircraft and maintenance of specific road nets in the Division zone. Further to be prepared to construct a class 50 floating bridge in the vicinity of site BRAVO. D Company was assigned the tasks of reconnaissance of specific roads in the Division zone, maintenance of specified road nets and to be prepared to construct a class 50 floating bridge in the vicinity of site ALPHA. H/S Company furnished personnel and equipment for a water point which was to be in operation by 1300, 11 January.

On 11 January at 0500 and 0540, A and C Companies moved by tactical motor march to selected bivouac areas. A Company was the first battalion unit to make contact with Aggressor, when they were hit by a small patrol shortly after joining Task Force Hungate. C Company had little trouble initially and were nearly complete with their assault crossing reconnaissance before they made contact with Aggressor. Between 1500 and 1600 the battalion commander met with each company commander on high ground overlooking each selected crossing site. The company commanders presented their plans and requested the necessary additional support. While with the C Company commander, the battalion commander received a request for engineer support in the construction of a P.O.L. dump for the support of the Division. The S3 selected C Company to accomplish this task, which required a platoon effort. B Company started construction of a liaison air field of pierced Steel Flanking, hauled crushed rock for and corduroyed parts of the Division road net, and attached one platoon to Task Force Meredith of Combat Command A. Task Force Meredith, a tank heavy force, had not been able to cross Otter Creek to their assembly area and needed fords, which were constructed by the 1st Platoon of B Company. B Company also completed their final reconnaissance and planning for the possible construction of the M2 floating bridge at site BRAVO. D Company made a complete reconnaissance of the Division road net and established a demolition mining plan for the Division zone. They also repaired and maintained specified road nets. Two culverts were constructed and crushed rock was hauled to the bad areas of the Division road net. D Company, supported by Headquarters and Service Company equipment, operated a quarry for the support of all companies of the battalion. C Company established a water point for Combat Command A at 1130. The Battalion forward CP was established along the Range Road favoring bridge site ALPHA. A company commanders' meeting was scheduled for 1630 for final briefing. During this meeting a fragmentary message was received from Division, placing the 23d Armored Engineer Battalion (—1 Platoon of C Co) under control of Combat Command A effective 2400, 11 January, 1956. Based on this message, plans were finalized for the construction of bridges at sites ALPHA and BRAVO. Due to weather conditions the Battalion commander felt that the available Engineer effort would not be able to construct both the road and the bridge at site BRAVO in a desirable length of time. The S3 recommended that the bridge for site BRAVO be floated down the river in rafts from site ALPHA. This would give B Company more time on the construction of the access road to site BRAVO prior to heavy traffic. This was agreed upon and a platoon of B Company was placed in support of D Company. The D Company Commander was to have charge of all operations at site ALPHA. The B Company men and

Bridge Company men needed at site BRAVO for the construction of the bridge would be floated down the river on the rafts as they were completed. Operations Order Number 2 was received from Combat Command A. The Division mission was to attack thru the 24th Infantry Division zone and establish a bridgehead across the Salt River and to continue the attack, seizing a Corps objective. Combat Command A was assigned the mission of establishing the bridgehead and seizing the high ground northeast of Salt River. The 23d Armored Engineer Battalion was to support an assault on the east bank of the Salt River which was to be made by Task Forces Hungate and Kapp. The Battalion was to be prepared to bridge the Salt River in the vicinity of sites ALPHA and BRAVO on order. Construction of the bridges was to be completed by 1500, 12 January 1956.

During the hours of darkness between 11 and 12 January, 1956, A and C Companies working with the Infantry heavy task forces Hungate and Kapp moved their assault boats and footbridges into their attack positions overlooking the river. They were still concealed and sufficiently close to provide a short carrying distance to the river. B and D Companies completed their planning, coordination and preparation for moving to the field and constructing the bridges.

On 12 January at 0500, B Company (—2 platoons) moved out tactically to its assigned bivouac area. They were to continue work on the access road to site BRAVO and to be prepared to receive the floating bridge rafts as they were floated down the river. D Company and its support moved out at 0530 to its assembly and bivouac areas in draws off the Porter River Road in preparation for the bridging operation at site ALPHA. At 0600 both A and C Companies jumped off from their attack positions assisting task forces Hungate and Kapp across the Salt River utilizing assault boats and footbridges. The attack went slowly with A Company, due to heavy enemy resistance, and had to close with Aggressor in order to clear the bridge site. C Company made a most successful surprise crossing and quickly had the immediate far shore area cleared for the bridging operation. A and C Companies continued inland along the trails to clear Aggressor, remove mines and road blocks and to prepare to block any Aggressor attempts to counterattack on the bridgehead areas. At 0730 B Company cleared its bridge site area and were prepared to receive rafts from site ALPHA. Their liaison airstrip was bombed at 0830. B Company suffered some casualties but repaired the airstrip and continued to work on the access road. B Company's bivouac area was hit by a gas attack with minor casualties. At 0730 D Company approached bridge site ALPHA and found it heavily mined on the near shore. Casualties were suffered while removing the mines and it was 0900 before actual bridge construction could be started. Due to the delay caused by removing the mine field coupled with slippery and muddy conditions and the heavy work clothing the men wore, progress was not as fast as estimated. At 1000 hours the Battalion Commander contacted the Combat Command A Commander and informed him that the bridging was going too slowly and recommended that all effort be placed on getting the bridge at site ALPHA completed. The CCA Commander approved and said he would plan on the site ALPHA bridge being completed at 1530 hours. One motorized crane broke down and had to be replaced. At 1400 hours Aggressor attacked from the far shore and nearly got to the bridge site. The men of D, B and Bridge Companies repulsed the attack and continued construction on the bridge. At 1430 hours Aggressor air, supplied by P51's of the Kentucky National Guard, attacked site BRAVO but were unable to see site ALPHA due to its location behind a steep hill around a bend in the river. The bridge at site ALPHA was opened at 1545 and tanks and vehicles started across. A and C Companies' vehicles crossed to join their units on the far shore. The Battalion Forward CP was crossed to a new location. During the day the Battalion commander visited all units, except A Company, by helicopter. A Unit Commanders' meeting was scheduled for 1800 at the new Forward CP. The Battalion Executive Officer and the Assistant S3 were notified to be at this meeting prepared to take over command and operation of the Battalion. At this meeting A and C Companies submitted their disposition and barrier position overlays. The Executive Officer and the Assistant S3 were briefed on the situation and the following missions for 13 January were given to the units. A Company was to remain in its present position prepared to execute its barrier plan. B Company was to continue its effort on the access road to site BRAVO and to be prepared to receive rafts from site ALPHA at approximately 0830. C Company was to remain in position prepared to execute its barrier plan. D Company was to continue to control the bridge at site ALPHA, construct rafts for site BRAVO and be prepared to relieve C Company in place on the barrier position at 1000. Bridge Company and one platoon of B Company were to continue to support D Company in the construction of rafts for site BRAVO. The Executive Officer and Assistant S3 took command of the Battalion in the field at 1830 12 January and the Battalion Commander and the S3 returned to the Battalion Rear CP.

At daylight on the 13th of January, raft construction at site ALPHA continued; however, the previous night had been very cold and the river had frozen, with ice up to one inch in thickness in some areas blanketing the river. Anchors were slung forward of each float to ward off ice and one power boat was sent down river to break a path in the ice. A raft started down river at 0800 but only got approximately one mile before it had to be returned due to many punctured floats. Additional plans were made but at 0930, when the Battalion Commander and the Combat Command Commander arrived at the site, it was decided to stop the operation to prevent further damage to equipment. During the morning C Company and the Battalion Forward CP were under Aggressor attack but D Company successfully relieved C Company which was ready to join Combat Command C in a combined arms exercise. A Company had cleared its area of Aggressor and B Company had the road open to site BRAVO. The Commanding Officer of Combat Command A declared the test finished at 1200 and the tactical operation ceased at that time.

This article appeared in the April issue of An Cosantoir, *The Irish Defence Journal. It is reprinted here with the kind permission of the editor. The author led a Panzer Corps, under Guderian, in the 1941 invasion of Russia. He led another Corps into Caucasia in the 1942 Stalingrad offensive. This article was translated by Thomas B. Dunne, Irish Army.*

ARMOR IN THE ATOMIC AGE

By GENERAL GEYR VON SCHWEPPENBURG, Retired

THE methods of ground combat to be applied in a future war are at present the subject of keen controversy among experts in various countries. The position has been pertinently defined by General Ridgeway, the former Chief of Staff of the United States Army, in an address to U.S. officers of different arms in which he referred to the "undefinable character" of future methods of combat.

It is necessary, first of all, to elucidate certain precepts underlying the significance and organization of armor and its future ooperational possibilities. This would appear to be all the more necessary since there is still current in some quarters a belief that the heyday of the tank is past.

Armor and Air

It has, for a long time, been abundantly clear that the air force and armor can either be excellent allies or mortal enemies. In the large-scale battle, continuous fire support by the tactical air force is a basic requirement during tank operations. By the end of the Second World War it was no form of ground defense but rather the rocket-carrying enemy aircraft, with its devastating, concentrated effect, which had become the most dangerous adversary of the German armored forces. The Allied mastery of the air had rendered impossible the old-style concentration of armor. Because of the entirely different air situations in East and West—and at the instigation of the author—a tank doctrine applicable to the West, and another applicable to the East, were taught in German tank schools from the middle of 1944.

Old Doctrine Obsolete

The old, standard doctrine of the German tank arm, dating from the time of its greatest successes, is no longer valid *in its old form* in this atomic age. This, in a manner reminiscent of the great Napoleonic battery, recommended the surprise concentration of a preponderance of artillery, protected by mobile armored forces, at a vital point of penetration; this concentration had to be effected at a speed which outpaced any possible counter-action by ground antitank defenses; it was then a case of "Through and forward!"

We said "no longer valid in its old form." The synchronization of the surprise (and ubiquitous) effects produced by an atomic missile dropped from the air with the effects produced by atomic carriers of the new-style armored combat group—rocket and atomic artillery—makes it possible to strike the same target at the point of penetration with much fewer guns.

The Offensive

We now come to the question of speedy concentration. It, too, is nothing new. It was necessary in the past in the case of every breakthrough. The exploitation of the first or second hour following a breakthrough has always been essential to the achievement of success. The question is, therefore, whether the combination of the effects of atomic weapons and the mobility of armor can still be regarded as practical in a tactical offensive under the combat conditions which will prevail in the atomic war theater. This question must be answered in the affirmative.

The armored arm is an offensive arm *par excellence*. Clausewitz, the great military theorist, designated defense as the strongest form of combat. Even the older Moltke, at the beginning of the sixties, seriously suspected that the defensive had been rendered superior to the offensive by the development of the firearms then in use. After overcoming his doubts, however, he won his victories by means of the *offensive*.

The history of two world wars has further demonstrated that the Clausewitz theory is *not* sound in practice.

It is of unusual psychological interest to note that the gravest doubts concerning the continuing effectiveness of the tank seem to come from two groups: from military writers in various countries who adopt a rarefied intellectual approach, based on philosophical and theoretical grounds, and from people whose thinking is dominated by the "infantry" concept.

Nobody in either of these groups has, however, at any time trained or commanded for any length of time, under varying conditions, large armored formations on the battlefields of East or West. Their views represent the *appraising* spirit of the study and General Staff office and not the *venturesome* spirit of the armored combat zones. They are predisposed to theorizing and precautionary defense.

Value of Defense

A certain degree of protection against atomic weapons is afforded by two very different means: the mobile tank and the static "good earth" (or, in other words digging in). Both are necessary in conditions of atomic warfare. A purely passive defense promises, at best, a gaining of time; only local and temporary decisions can accrue from it.

Hence this purely passive defense cannot generally be accepted as sound in operations directed against an extensive enemy force. With regard to the proposal that this defense should be based on prepared fortifications, it must be added that every detail of such fortifications would be known to the enemy in advance and they could easily be eliminated by atomic weapons or paralyzed by vertical envelopment.

As will readily be appreciated, such a tendency would sacrifice the most valuable quality of all, initiative. It would leave the enemy with complete freedom of action.

It has never been proved, nor can it be proved, that tank tactics adapted to the atomic situation have fallen into discredit.

On very many occasions indeed German tank commanders were confronted with the task of making fundamental decisions because of the enormous and locally superior effectiveness of a particular weapon.

Pre-Normandy Concept

The responsible, professionally-trained commanders of the German armored formations had, before the beginning of the invasion, proposed the adoption of the so-called "tiger tactics" as the basic defensive concept. They recommended the organization of dispersed combat groups which could be rapidly concentrated, their disposal in ambush positions from which they would be ready to strike at a moment's notice and the quick crossing, by night, of "no man's land" to effect a breach in the enemy's defenses.

This procedure was intended to lessen or negate the superior effectiveness of the enemy air force and the fire of the powerful enemy battle fleets which extended far inland. This effectiveness would then have been eliminated by the breakthrough into the enemy theater of operations, just as the enemy atomic defense would

U. S. Army

The question is, whether the combination of the effects of atomic weapons and the mobility of armor can still be regarded as practical in a tactical offensive under atomic combat conditions. The answer must be in the affirmative.

today automatically be eliminated if such a penetration of the defense were effected. Only at a high price, and with what can only be described as Eastern ruthlessness, could the enemy's atomic weapons bring the combat zone of their own forces under fire.

The implementation of this concept in World War II came to grief primarily through the opposition of Berchtesgaden, in spite of Guderian's advocacy of the idea.

Concentration Problems

Atomic action will render whole areas, with everything in them, *hors de combat*. Hence, troop concentrations must be avoided or limited to the shortest possible periods. The mobile combat units, whose size must be kept down, must be deployed over large areas in width and depth in chessboard fashion. The discovery of movements by airborne radar—which is also effective at night—will attract atomic fire from the enemy in the air, or on the ground, and could lead to annihilation.

The answer to this state of affairs lies in maximum rapidity and an issuance of orders at top speed through a shortened chain of command, as in the case of air force or naval units in action. The command decisions will inevitably involve a certain element of chance. This reminds one of the cavalry charge in the period of Frederick the Second. Movement and combat can be conducted only under cover of night or in twilight conditions. This demands a considerable alteration in present training methods.

Independence

Every consideration points to the reduction and, in particular, the additional independence of the combat groups. They must be of a size which permits them to carry out movements and conduct combat in darkness. They must have immediately to hand, and under their own command, everything required to ensure their complete independence: reconnaissance aircraft, helicopter-borne "advanced cavalry," motorized cross-country supply formation and aerial supply and transport squadron.

The independence of the subordinate commanders, which was once the secret of success, must be reinstated.

We will need the lightning alternation between attack and defense. The mobile part of our defense can be conducted only by the air force and by armor.

A further revolutionary requirement in the field of organization demands that the air force formations to cooperate with the army should be an *integral part of the army*, as is now the case, following intense effort, in the British and American fleet air arms.

Organization

With regard to the organization of the modern armored combat groups, everything must be unified and welded together, in the form of a joint regimental formation, including the basic components of its diverse air elements incorporated in the army. This is another concept which in part is not new. It had already been seriously discussed before the Second World War by the leaders of the German armored formations.

The leaders of the modern armored groups must bear in mind that the great road networks, because of contamination and the danger of detection, are generally denied to them during daylight; and that mobile forces will enjoy a relative degree of protection against atomic action when they are accompanied by tanks. Above all, every single vehicle must be suitable for cross-country work.

These considerations restrict such an armored formation in size to a strong tank battalion with a strong, armored, quintuple grenadier battalion (lorried infantry) as nucleus. Such a group with its organizational attachments can still operate at night. Since the loss of whole units is to be expected, provision must be made for rapid reinforcement from positions in rear. Up to seven groups can be made subordinate to a corps headquarters staff. The divisional system must be dropped in order to shorten the chain of command.

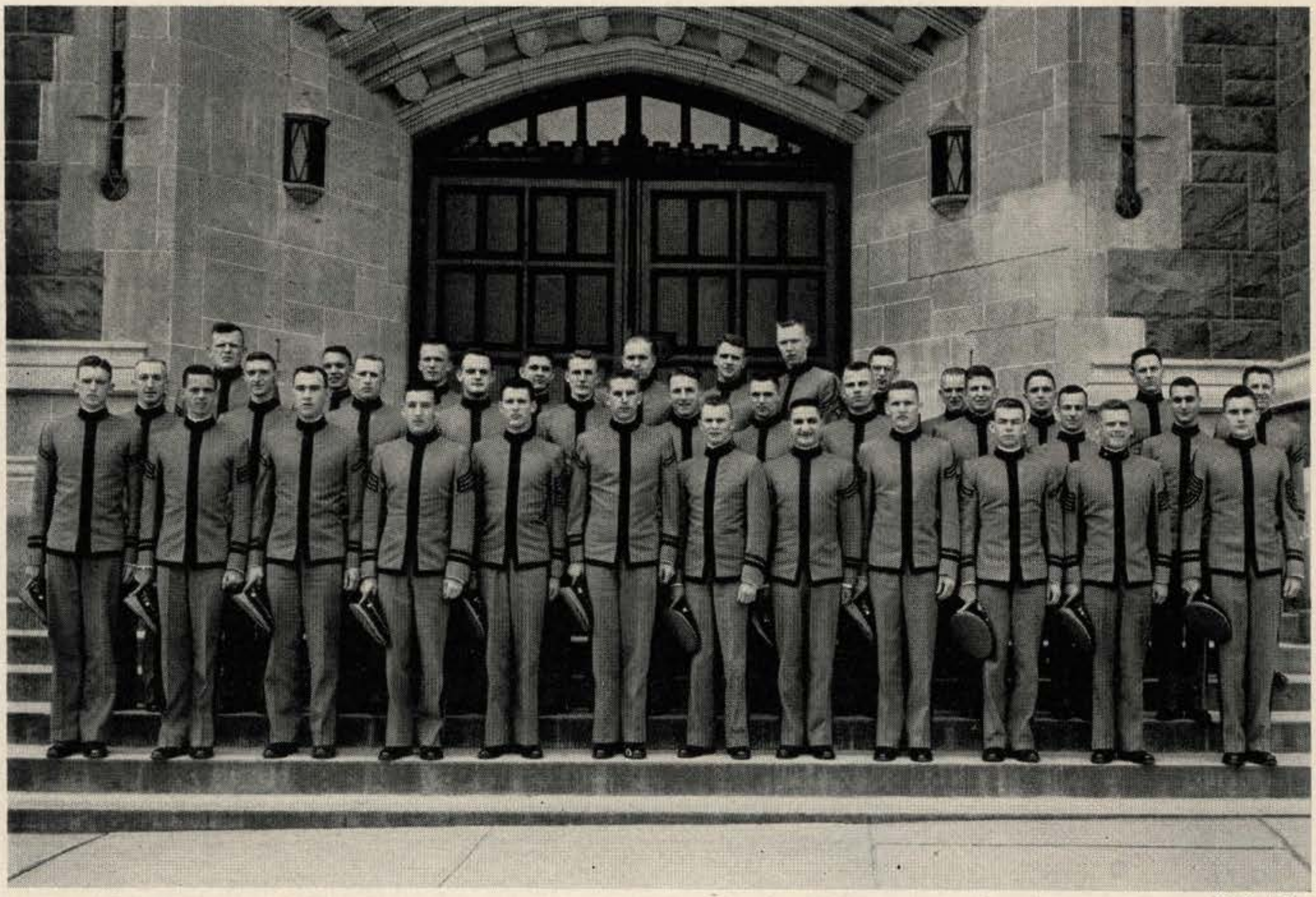
Supply

The provision of supplies will be one of the most difficult problems in condition of mobile atomic warfare. It appears that there are only two ways of solving it. One is that, in principle, supplies should be brought up by flexible air transport, namely helicopters, during the night. The other consists in the permanent organizational assignment of a special squadron to each combat group to carry iron rations, ammunition and spare parts. The supplying of fuel from the air must, at least in part, be carried out during darkness. We must make the best of the increased risk involved in the employment of these air supply formations.

Conclusion

In war many things are risky. A calculated risk can be the origin of great success. Hence the question whether offensive mobile operations are still possible even at night and in twilight conditions, in the face of radar detection and atomic weapons, cannot be answered on theoretical grounds or on the basis of peacetime experience alone. Only wartime conditions can determine whether the means chosen are the right ones to gain and retain the initiative. As late as 1939 the tank was still regarded by very influental German military men as a novel but ephemeral type of toy which would soon be replaced by the infantry when matters really came to a serious pass.

This error was clearly illustrated by the successes gained by the Berlin Armored Division in the first large-scale battle of the Second World War, the Battle of the Corridor, in which Polish troops fought with indescribable bravery, and by the successes gained by its armor operating against infantry forces in the first great night battle on the 2d of September, 1939. This represented the triumph of the unshakeable spirit of attack over forces which succumbed to despondency and indecision.



U. S. Army

Front row, l. to r.: Wold, H. G.; Sewell, J. H.; Harris, J. A.; Frederick, W. R.; Sorley, L. S.; Nicholson, R. K.; Lee, D. C.; DiGennaro, W. L.; Palmer, D. R.; Smith, F. L.; Day, F. L.; Brown, F. J. Second row, l. to r.: Loffert, G. U.; Stynes, P. A.; Weihl, W. L.; Hooker, W. M.; Parker, C. R.; Westcott, W. C.; Schoonmaker, M. D.; Huff, J. H.; Graesser, D. C.; McCahan, W. L.; Poole, C. E. Third row, l. to r.: Glock, H. G.; Ebert, V. E.; Dozier, J. L.; Woodmansee, J. W.; Chesnauskas, R. J.; Johnson, H. W.; Richards, R. N.; Martin, G. J.; Harding, T. C.; Haponski, W. C.; Rostine, G. W.; Ross, M. Absent: Johnsen, J. L.

United States Military Academy Class of 1956 Armor Graduates

On the 5th of June of this year, 36 members of the graduating class at the United States Military Academy, having completed their four-year course and received their gold bars, commenced their commissioned service in Armor.

At the termination of their graduation leave they will report to Fort Knox for the Basic Armor Officer's Course. Upon completion of this course each officer will be assigned to troop duty with Armor units in the United States or overseas.

During their four-year course at the Military Academy, all cadets receive tactics instruction in all the branches of the Army with emphasis on the combat arms. The Armor instruction includes organization, communications, tank gunnery and basic tactics. These subjects are taught both in the classroom and in the field. The Armor Section at West Point is responsible for this Armor training. The Section is equipped with the latest tanks and equipment, so that the cadets become familiar with the most up-to-date equipment available to units in the field. The amount of instruction presented is limited because of the large number of other requirements in the curriculum, but it is sufficient to give each graduate a good foundation in Armor doctrine and principles.

The Armor Section at the Military Academy is a part of Combat Arms Detachment, 1st Regimental Combat Team, and is commanded by Major Kenneth R. Lamison who has the dual function of Commanding Officer and Senior Armor Instructor. Assisting Major Lamison are Captain James A. Day, Executive Officer, and 50 qualified noncommissioned officers and men.

Many of the cadets who chose Armor have been junior members of the Armor Association. The Association awarded these graduates honorary one-year memberships. In addition each graduate was given a copy of *Preparation for Leadership in America* by Robinett and *Tank Company Commander's Guide* by Brier and Moore.

We are certain that all Armor personnel are happy to welcome this group of officers to our ranks and to extend best wishes for long and distinguished careers in the mobile arm.

NEWS NOTES

The Armor Center and The Armor School

Effective the 2d of May 1956 the Armored Center and the Armored School were redesignated The Armor Center and The Armor School. This information was contained in Department of the Army General Order No. 17, dated 1 May 1956.

Army Develops New Test Projectile Composed of Paper and Water

A new artillery projectile made of paper and water has been developed by the Army in order to provide an inexpensive shell for test firing, the Department of the Army announced recently.

Made at present only for the 105mm howitzer, the new shell costs about $1.00. This compares with the $10.00 cost of the conventional metal projectile. Its weight and resistance to the expansion of the propellant gases make it possible to test operation of the howitzer's recoil system.

The 105mm howitzer using this shell may be fired where the range is only a matter of 100 feet or so, for the muzzle blasts forth only water and bits of paper. It is, therefore, useful in testing weapon recoil and in demonstrations.

Developed at Rock Island Arsenal, Rock Island, Illinois, the shell was test-fired at Aberdeen Proving Ground, Maryland, and the Erie Ordnance Depot at Port Clinton, Ohio. The shell consists of two wax-impregnated, kraft paper tubes. These are four inches in diameter and 42 inches long and resemble elongated ice cream containers. Each end of each tube is sealed with three one-eighth inch cardboard disks. The projectiles are filled with water through a three-quarter inch hole in the forward end which is then closed with a cork.

The new type of projectile is filled with water just before firing and then loaded into the gun's muzzle instead of the breach. Standard rounds are loaded into the breech.

The water spray from the projectile is harmless, but the cardboard end closures may damage targets at a distance of 75 feet. At 125 feet there is almost complete safety against flying particles of cardboard.

6000 Army Reservists Started Six Months Active Duty Training in June

Approximately 6000 Army Reservists, 17 to 18½ years old, started their six-month active duty training in June, the Department of the Army announced recently.

This is the largest group to report for training since the enactment of the Reserve Forces Act of 1955, which allows young men 17 to 18½ years of age to serve on active duty in the Army for six months and then complete their military obligation by serving in their local Army Reserve unit.

The majority of the group reporting in June were men who previously enlisted in the Army Reserve and had their active duty training deferred until they were graduated from high school.

As of May 18, a total of 33,727 men had signed up for all of the Reserve Forces Act programs. Of this number, 21,864 had signed up for the six months active duty training program.

Television Equipped Aerial Drone Developed to Aid Ground Commanders

A television pickup system utilizing an aerial drone and designed to aid combat commanders in obtaining immediate ground evaluation was announced recently by the Department of the Army.

The system was publicly demonstrated by the Army at Bolling Air Force Base, Washington, D. C., in connection with Armed Forces Day ceremonies.

Live TV shots can be made of strategic territory from the drone and then broadcast to a ground control station. The converted L17 aircraft being used in the system is an experimental aircraft and initially will be flown with a safety pilot aboard to observe the results of remote control operation. After completion of tests with a safety pilot aboard, the aircraft will be flown as a pilotless system in further tests.

Remote control operation has currently been tested over a 25-mile area. However, the operational range will be governed by the range of the radar tracking system.

Results will be "instantaneous ground evaluation" with broad potentialities, according to Army Signal Corps Engineering Laboratories' scientists.

The pilotless system consists of an L17 aircraft modified for television photo-drone operation, an auto-pilot which

COMMAND CHANGES

Maj. Gen. Thomas L. Harrold
USARCARIB

Maj. Gen. William N. Gillmore
Commanding General III Corps

Maj. Gen. Verdi B. Barnes
Commanding General 4th AD

provides effective remote control by means of on-off-type radio signals, and a ground control station that can be carried in a jeep.

The 250-pound ground station is weather- and shock-resistant. It includes radio links for commanding the drone and for communicating with the safety pilot.

Signals transmitted from the ground station to the airplane's 42-pound autopilot regulate stability, altitude and air speed. Complying with remote commands, the aircraft will maneuver, climb, or glide. Special control provisions prevent stalls, over-speeding, excessive loss of altitude and other hazardous conditions.

Upon completion of the drone's mission, the ground controller flicks an "approach" switch which automatically positions landing gear, flaps, propeller pitch and power in proper sequence for approach and landing.

Still photos also may be made using this system.

Vertiplane to be Developed Under New Army Contract

Award of a contract for the design and development of a flying test bed, "deflected slipstream," turbine-powered, vertical take-off and landing (VTOL) aircraft was announced recently by the Department of the Army.

The $700,000 Army contract is being administered for the Army by the Office of Naval Research and was awarded to the Ryan Aeronautical Company, San Diego, California.

Employing the deflected slipstream principle, the new aircraft is called the "Vertiplane" and uses large propellers and double retractable wing flaps.

Scheduled to be powered by a single gas turbine which will drive two propellers, the "Vertiplane" embodies a conventional configuration except for the wing, which incorporates large double retractable flaps located in such a way that the propeller slipstream can be deflected 90 degrees downward during take-off, hovering and landing.

For transition into horizontal flight, the flaps are retracted as the plane picks up forward speed and the slipstream then flows horizontally.

Flying test beds (research aircraft) are flying "mock-ups" intended to simulate the essential design and performance characteristics of new design concepts. They are applied research tools designed to determine by flight experience, the validity of new design concept.

Through projects such as this, the Army, in cooperation with the Office of Naval Research, is exploiting the basic research that has been accomplished by the National Advisory Committee for Aerolift aircraft. The Army expects to utilize the most promising of the new aircraft design configurations in the development of a new family of VTOL (vertical take-off and landing) and STOL (short take-off and landing) aircraft.

Development of aircraft in this field, which will have the speed, range and pay-load of the fixed wing airplane coupled with the short to vertical take-off and landing capability of the helicopter, is part of the Army's program to increase the tactical mobility of its combat troops.

Utilization of the flying test bed approach in designing VTOL and STOL aircraft will permit the characteristics of such aircraft design to be explored with relatively inexpensive aircraft in a matter of months, rather than the years required to design and construct costlier prototypes.

Army Awards New Contract for VTOL Aircraft Design

Award of a contract for the design and development of a flying test bed, "tilt wing" turbine-powered vertical take-off and landing (VTOL) aircraft was announced recently by the Department of the Army.

The $850,000 Army contract was awarded by the Office of Naval Research to the Vertol Aircraft Corporation, Morton, Pennsylvania.

In hovering flight the tiltable wing is in the vertical position and the rotor-propellers provide vertical thrust, as in a helicopter. In cruise and high speed flight the wing is in the normal horizontal position.

The transition from vertical lift to forward flight is accomplished by tilting the wing-propeller combination forward. Thus, in forward flight the tiltable wing provides lift and the rotor propellers provide forward thrust, as in conventional aircraft.

Utilization of the flying test bed approach in designing the VTOL aircraft will permit the characteristics of the tilt wing aircraft design to be explored with a relatively inexpensive aircraft in a matter of months, rather than the years required to design and construct a costly prototype.

Through these studies the Army hopes to eliminate the need for prepared landing fields and to achieve higher forward flight speeds. This development is part of the Army's program to increase the air mobility of its troops and supplies in the combat zone.

General research along these lines by the military services also will benefit small communities now unable to afford airports requiring long runways and expensive terminal facilities, since helicopter-type landing facilities will be adequate for the operation of VTOL aircraft.

Ten Army Non-Divisional Units to Move to Europe

Ten U. S. Army non-divisional units will move to Europe early next year to replace ten like units under Operation GYROSCOPE, the Department of the Army announced recently.

The 11th Armored Cavalry Regiment at Fort Knox will Gyroscope with the 6th Armored Cavalry Regiment in March 1957; the 9th Engineer Battalion, Fort Lewis, with the 35th Engineer Battalion in March 1957; the 78th Engineer Battalion, Fort Benning, with the 499th Engineer Battalion in February 1957; the 63d Engineer Battalion, Fort Leonard Wood, with the 5th Engineer Battalion in February 1957; the 168th Engineer Battalion, Fort Campbell, with the 70th Engineer Battalion in March 1957; the 498th Engineer Battalion, Fort Ord, with the 54th Engineer Battalion in April 1957; the 714th Tank Battalion, Fort Benning, with the 826th Tank Battalion, in March 1957; the 534th Field Artillery Battalion, Fort Sill, with the 290th Field Artillery Battalion in February 1957; the 55th Field Artillery Battalion, Fort Sill, with the 765th Field Artillery Battalion in February 1957; and the 720th Field Artillery Battalion, Fort Lewis, with the 30th Field Artillery Battalion in February 1957.

Low Ground Pressure Tractor Developed by Corps of Engineers

A special low ground pressure tractor has been developed by the Corps of Engineers' Research and Development Laboratories at Fort Belvoir, to tow "trains" of supplies and material over soft winter snow and summer muskeg in the Arctic.

Fabricated essentially of parts from a conventional tractor, it has a unit ground pressure of only 3.4 pounds per square inch . . . almost five pounds per square inch less than that of its standard counterpart.

The tractor, powered by a six-cylinder diesel engine capable of 225 horsepower, is equipped with an extended frame which provides a track 160 inches long on the ground. Track "shoes," 54 inches wide, make the extremely low ground pressure possible.

Manufactured by the Peterson Tractor and Equipment Company of San Leandro, California, the tractor utilizes standard controls, steering clutches and transmission. It also incorporates a torque converter with a manual locking device, and a cab which provides protection and comfort for the operator.

A smaller version of the tractor, powered by a 195 horsepower diesel engine, has also been developed. Thirty six-inch wide track shoes are used to provide a unit ground pressure of 4.15 pounds per square inch.

Both tractors towed sleds laden with heavy supplies during tests conducted by the U. S. Army Transportation Corps on the Greenland Ice Cap and at Houghton, Michigan. Tests indicate that the tractors may provide the Armed Forces with a comparatively slow, but effective Arctic "locomotive."

A unit ground pressure considerably lower than that provided by standard commercial tractors is required to permit successful cross-country operation in the Arctic. Improper weight distribution and the lack of flotation render the standard tractor inoperative in the soft winter snow and summer muskeg.

FROM THESE PAGES

65 Years Ago

The cavalry division is an independent tactical body, and stands in a strategical rather than a tactical relation to the rest of the army. Its service is rendered in advance of the army, where it acts as a screen, preventing the enemy from seeing or learning of any movement during the strategical period of the campaign. It is of equal importance that the cavalry division should see and know of every movement made by the enemy during this period, and report them to the army commander.

Before starting on his mission in advance of the army, the cavalry leader should be given all the information by the army commander that is in the possession of the latter, regarding what is known of the enemy, his possible position, his probable intentions, his line of communications, etc. If possible, he should be furnished with a map of the theater of operations. The army commander should inform him about when and in what direction it is probable that his own army will move. He should be informed of the present intentions of the army commander and he should be told what the latter is the most anxious about at the present moment. Finally, the cavalry commander is informed where he is to send his first reports and where he can rely upon getting support from other bodies of troops.

CAPTAIN A. E. WOOD

The Proper Employment of Cavalry

50 Years Ago

The army is divided into two parts: the part that plans and the part that executes. Both are inter-dependent. Alone, neither could accomplish results. Just as the arms execute the mandates of the brain, so the army executes the orders of its leaders. But when strategy has played its part and armies have been maneuvered in the theatre of war so that finally they stand face to face, it is the man who decides the fate of battle. The brunt of the struggle, the attack, the assault, the final victory or defeat, rest with the private soldier.

Since we have become a nation our proudest boast has been that the American soldier, because of his superior intelligence, is the best soldier in the world. But the quality of the man alone is not enough. He must be trained to his work. Not only this, but he must be so well trained that he represents the best. This is our ambition; nothing short of this is completely satisfactory.

The efficiency of an army is represented by the individual training of its soldiers. With the perfection of the modern small arm and the consequent necessary abandonment of mass action, individual efficiency, initiative and intelligent aggressiveness constitute the dominant factors that will be decisive in future warfare.

LIEUTENANT C. A. BACH

Better Marksmanship

25 Years Ago

In reading of the tactics appropriate to such a fight we are apt to find ourselves enmeshed in a web of strange words, such as the "Pivot of Maneuver," "The Mass of Maneuver," etc. If instead of this we describe the tactics appropriate by saying: "Grab the enemy by the nose and kick him in the pants," we sacrifice purity to precision but we express the idea.

Cavalry tries to do just this. It grabs the hostile nose and tries to hold it by a violent and noisy head-on attack, using its automatic weapons and some dismounted troopers; while with most of its force mounted, it moves rapidly to a place from which the pant attack can be made with vigor and by surprise. We have dismounted part of our force to hold the enemy and have sent the rest off mounted to gain a position in rear from which they may attack.

If the enemy learns what is going on in time to deploy an effective, unshaken firing line against the turning movement, the attacker has the choice of either repeating the nose and pant attack by dismounting a portion of his own force to grab the new nose and again turning with the rest, or to risk the fire and charge home.

MAJOR GEORGE S. PATTON

Motorization and Mechanization in the Cavalry

10 Years Ago

Before 1938, a tank driver's back was sore and bruised after each day's operation. All signals to the driver from the tank commander, who sat behind him, were made by the commander's foot. If the commander wanted the tank to move forward, he tapped his foot against the driver's back. To move faster, the tapping was increased in tempo. To turn right or left, the foot was put either on the right or left shoulder. To back, it was pressed against the driver's neck or head. To stop or slow down, a steady pressure was used against the back of the driver.

Realizing the inefficiency of this method of communication, The Infantry Board and The Mechanized Cavalry Board began experiments to improve it. In 1938, the first interphone communication equipment, incorporating amplification, was designed exclusively for use in tanks and other armored vehicles. The equipment was designed by the Signal Corps Laboratories, and in the fall of 1938 was mounted in the M2A2 light tanks of Company E, 66th Infantry Regiment (Light) at the request of The Infantry Board. The radio sets which were installed in the tanks for the experiment were SCR 193s and SCR 245s. No provision was made for the remote operation of the radio by the tank commander.

LIEUTENANT JOHN F. HORAN

The Interphone System in Armored Vehicles

news from THE ARMOR SCHOOL

The Defense of St. Vith, Belgium

Two of the most important tactical localities on the 88-mile front held by the VIII Corps in the Ardennes Forest, at the beginning of the Battle of the Bulge, were Bastogne and St. Vith. Because of the gallant defense of Bastogne by its garrison, much of the comment pertaining to the Battle of the Bulge has centered around this action. This fact has caused many to lose sight of the importance of St. Vith and the gallant stand for its defense by elements of Corps troops, remnants of the 106th Division, and CCB of the 7th Armored Division.

Realizing the importance of St. Vith to the American Forces, the Corps Commander directed the Commanding General of CCB, 7th Armored Division, to move his command to that locality and to assist in the defense of that important road center. Though Armor was not designed primarily for the role of defense, the operation of CCB at St. Vith was a good example of how it can assume such a role in an emergency. The aggressive defensive measures undertaken by the commander completely disrupted the enemy's plan on that part of the battle line. The Defense of St. Vith, 17-23 December 1944, is an excellent example of how American troops held their ground in the midst of confusion, defeat, and uncertainty, and thereby threw the German timetable sufficiently off schedule to allow American Forces to regroup, hold and counterattack. The stand at St. Vith has been recognized by both German and Allied Commanders as a turning point in the Battle of the Bulge.

From the personal files of Lieutenant General Bruce Clarke, a booklet entitled *The Defense of St. Vith* was prepared in 1948. The initial stocks of this document were soon depleted. The demand for this report has been so great that The Armored School has reprinted it in a limited number. It is now available for sale through the Book Store, The Armored School and can be ordered at a cost of 40 cents per copy.

References for Tank Gunnery Training

The Armor School has reviewed the references and training films available for tank gunnery training, and has determined that the following items are generally applicable for a commander and his staff when planning and preparing for such training.

Manuals: FM 17-12—Tank Gunnery; FM 17-78—Tank, 90mm Gun, M47; FM 17-79—Tank, 90mm Gun, M48; FM 17-80—Tank, 76mm Gun, M41A1; FM 23-55—Browning Machine Gun, Cal .30; FM 23-65—Browning Machine Gun, Cal .50, HB M2; FM 21-6—Techniques of Military Instruction; TM 9-1901—Artillery Ammunition; TM 9-2810—Tactical Motor Vehicle Inspection and Preventive Maintenance Service.

Firing Tables: 76-I-1 (Abr)—76mm Gun, M32, on Tanks, M41; 76-H-2 (Abr)—76mm Gun, M32, Aiming Data Chart; 90-N-0 (Abr)—90mm Gun (M36 and M41).

Other References: AIP 17-300—Armor Training Program; AR 385-63—Safety Regulations for Firing Ammunition for Training, Target Practice, and Combat; TA 23-100—Allowances for Training Ammunition; SNL ORD 3 R-1—Tank Gun Ammunition; SNL ORD 3 T-1—Small Arms Ammunition; Area or Army Training Aids Catalog; Catalog of Instructional Material and Graphic Training Aids, The Armor School; Training Film and Equipment Exchange Catalog; Post Range Regulations; Major Unit Training Directive; Letter, CONARC, 18 Nov 55, subject: "Proposed Changes to Tank Gunnery Qualification Course."

Training Films: (See Instructor's Film References) TF 17-1974—Fundamentals of Tank Turrets—Part I; TF 17-1975—Fundamentals of Tank Turrets—Part II; TF 17-2117—M12 Range Finder, Characteristics—Part I; TF 17-2118—M12 Range Finder, Preparation for Ranging—Part II; TF 17-2179—M12 Range Finder, Adjustment and Use—Part III; TF 17-1548—Range and Speed Determination; TF 17-1968—Crew Firing Duties, M41 and M41A1 Tank, Part I; TF 17-1969—Crew Firing Duties, M41 and M41A1 Tank, Part II; TF 17-1970—Crew Firing Duties, M47 Tank; TF 17-1971—Crew Firing Duties, M47 Tank, Part II; TF 17-2288—M13 Quadrant, Use; TF 17-2289—M13 Quadrant, Adjustment; TF 17-2290—M1 Gunner's Quadrant, End-for-End Test, Plus Corrections; TF 17-2291 M1 Gunner's Quadrant, End-for-End Test, Minus Corrections.

Army Subject Schedules: SS 17-13—Mechanical Training, Tank Guns; SS 17-14—Maintenance of Fighting Compartment; SS 17-16—Tank Gun Ammunition; SS 17-18—Auxiliary Fire Control Equipment; SS 17-19—Range Finder M12 or M13 (T46E1); SS 17-21—Range Determination; SS 17-22—Crew Drill; SS 17-23—Conduct of Fire.

Carbon Monoxide in Crew Compartment of the M48 Tank

Information received on reports of recent accidents in the field involving asphyxiation by carbon monoxide in Tanks, 90mm Gun, M48, have made it imperative that the causes for these accidents be made known to all troops involved in operating these tanks. From reports of the incidents, it appeared that the absence of the canvas gun mantel from around the 90mm gun shield may have allowed excessive carbon monoxide from the auxiliary generator to enter and contaminate the tank personnel compartment. A test, based on these reports, was conducted by The Armor School Automotive Department and the Preventive Medicine Division of the 2128-1 US Army Hospital, Fort Knox.

The results of this test showed that under certain conditions a safety hazard does exist when the auxiliary generator is being operated. Danger exists when the gun is pointed to the rear, the auxiliary generator running, the canvas gun shield cover missing or damaged, the main power plant off, the tank buttoned up, and the ventilating blower not in operation.

It was found that crew members could not be expected to survive when exposed to these conditions for periods longer than five minutes.

With the gun pointed to the front, other elements of the situation remaining the same, the crew compartment became dangerously contaminated in two hours.

These conditions are therefore considered to be a safety hazard, and steps must be taken to reduce crew exposure. The following measures will accomplish this:

1. The canvas gun shield cover must be properly installed and in a serviceable condition at all times.

2. When the auxiliary generator is being operated with the main power plant off, the hatches should be kept open and, where practical, the gun pointing to the front.

3. The ventilating blower must be running when the tank is buttoned up and the auxiliary generator or personnel heater is operating.

4. Crews should avoid sleeping inside or on the back deck of the tank while the auxiliary generator is running.

Close attention to the above measures, adherence to already published safety precautions, and the application of common sense by the crew can reduce if not completely eliminate the hazard.

Composition and Terminology of Armor Tactical Groupings

The flexible organization of the armored division permits the formation of tactical groupings designed to accomplish specific missions. The size and composition of the tactical groupings frequently will change with the progress of battle. To standardize instruction on this subject at The Armor School, the School has recently published guide lines concerning the command, composition, designation and terminology applied to tactical groupings of the armored division. These guide lines—

1. Emphasize the task force and team aspects of armored division employment.

2. Emphasize that combined-arms teams should be commanded at the level which will permit their most effective utilization.

3. Point out that in some tactical situations tank battalions and armored infantry battalions will be the major subordinate elements of the combat command.

Depending upon the situation, combat commands may be organized into two or more task forces (combined arms integrated at battalion level); or in certain operations—such as exploitation over terrain favorable for tanks, or the attack of a river line —the combat command may employ tank and armored infantry battalions (combined arms integrated at combat command level).

When battalions are the major subordinate elements of the combat command, there is no problem with regard to terminology, command and composition of the battalions and companies. That is not the case when the command is organized into task forces.

Task forces are commanded by the commanders of the tank and armored infantry battalions controlled by the combat command. Normally, a tank-heavy task force will be commanded by the tank battalion commander, while an armored infantry-heavy task force will be commanded by the armored infantry battalion commander. As a general practice, these major subdivisions of the combat command will be referred to as *task forces,* not as *reinforced tank battalions* or *reinforced armored infantry battalions.* The mission will determine the composition of the task force and its command.

The major subordinate elements of the task force will be designated as teams. Basically, a team will consist of a combination of a tank company and armored infantry elements of from platoon to company strength, or a combination of an armored infantry company and tank elements of from platoon to company strength.

In determining who will command a team, the task force commander considers the following factors:

1. Mission of the team.
2. Composition (tank-heavy or infantry-heavy).
3. Personalities involved.

Thus a team composed of a tank company and an armored infantry platoon would normally be commanded by the tank company commander, while a team composed of an armored infantry company and a tank platoon would be commanded by the armored infantry company commander. In the case of a team made up of a tank company and an armored infantry company, the task force commander could designate either company commander as the team commander. Another equally acceptable method is for the task force commander to directly command all company-sized elements of the task force; this method might be particularly desirable when the task force is attacking on one axis. A less acceptable method is to designate qualified battalion staff officers to command the teams.

Subordinate elements of teams—tank and armored infantry platoons—will be commanded by the platoon leaders. As a general rule, one platoon leader will not be given the mission of commanding a platoon other than his own—for example, the leader of a tank platoon would not normally command an armored infantry platoon as well. Usually, a team commander can best ensure coordinated action by directly commanding his platoon-sized units. Under exceptional circumstances, such as when a tank platoon and an armored infantry platoon are joined to perform a semi-independent mission, one of the platoon leaders will be designated as the commander of the combined platoons.

Key Personnel Changes

Colonel W. G. Dolvin, Director of the Command and Staff Department, has been transferred to the Department of the Army, Washington, D.C. Colonel A. L. West, Jr. is the new Director of the Command and Staff Department.

Lt. Col. R. A. Rawley has been named Secretary, The Armor School.

THE ARMOR SCHOOL HONOR GRADUATES

The following students received top scholastic honors of their classes (listed in order of rank in the class):

Armor Communication Supervision Enlisted Course Class Nr 3

Sgt Alton L. Thomas, Co B, 133d Tk Bn, California NG, Corona, California; SP3 William Fisher, III, 100th Tk Bn, 1st Armd Div, Fort Polk, Louisiana; SP2 Joseph L. White, Jr., 25th Recon Bn, 4th Armd Div, Fort Hood, Texas.

Armor Radio Maintenance Course Class Nr 7

Pvt Lewis B. Gustafson, Co B, 29th Armd Inf Bn, 3d Armd Div, Fort Knox, Kentucky; PFC Helmut Koehler, Co A, 30th Tk Bn, 3d Armd Div, Fort Knox, Kentucky; Cpl John C. Statham, 3656th Ord Co, Miss NG, Hattiesburg, Mississippi.

Armor Officer Basic Course Nr 4

2d Lt Ralph J. Powell, 1st Armd Div, Fort Polk, Louisiana; 2d Lt Jerry F. Babik, 4th Armd Div, Fort Hood, Texas; 2d Lt Melvin G. Burkart, USA Tng Cen, Armor, Fort Knox, Kentucky; military stakes, 2d Lt Frank W. Gyetvan, 1264 SUPC, Fort Dix, New Jersey.

Armor Track Vehicle Maintenance Course Class Nr 13

Pvt Edward J. Donnelly, H&S Co, 83d Recon Bn, 3d Armd Div, Fort Knox, Kentucky; SFC Silas E. Knee, Hq, 702d Ord Bn, 2d Inf Div, Fort Lewis, Washington; Pvt Michael B. Thompson, 1st Armd Div, Fort Polk, Louisiana.

Armor Track Vehicle Maintenance Course Class Nr 14

PFC James M. Pope, 4th Armd Div, 25th Recon Bn, Fort Hood, Texas; Pvt Eugene J. Probst, 1st Armd Div, Fort Polk, Louisiana; Pvt David M. Lynch, Hq & Hq Det, Stu Regt, Fort Knox, Kentucky.

Armor Advanced NCO Nr 4

SFC Arthur J. Palmer, Co G, 3d Bn, 11th Armd Cav, Fort Knox, Ky; Armor Leadership Award team: team leader, SFC Jimmie J. McCreadie, Co C, 193d Tk Bn, Calif NG, Canoga Park, Calif; team members: Sgt William L. Adkinson, Co B, 190th Tk Bn, Georgia NG, Fitzgerald, Ga; MSgt James N. McFadden, Co A, 241st Tk Bn, Kentucky NG, London, Ky; SFC Ralph R. Dickenson, Co B, 1st Bn, 11th Armd Cav, Fort Knox, Ky; SFC Eugene McMackin, Co C, 509th Tk Bn, 11th Armd Cav, Fort Knox, Ky; Sgt Albert L. Wigington, Tk Co, 1st Bn, 150th Armd Cav, Charleston, W. Va.

Armor Officer Basic Course Nr 5

2d Lt Edward R. Till, 2018th SU, Fort Knox, Kentucky; 2d Lt John H. Jenney, USAFFE (Japan); 2d Lt Harry E. Childs, 30th Tk Bn, Fort Knox, Kentucky; military stakes, 2d Lt Edward R. Till, 2018th SU, Fort Knox, Kentucky.

Armor Communication Supervision Enlisted Course Nr 4

SP3 Endel Barbits, Hq, H&S Co, 2d Tng Regt, The USATC Armor, Fort Knox, Kentucky; SP2 Wesley Rose, Hq, H&S Co, 526th Armd Inf Bn, Fort Knox, Kentucky; Pvt John R. Thomas, 16th Armd Engr Bn, 1st Armd Div, Fort Polk, Louisiana.

Armor Radio Maintenance Course Class Nr 8

SP3 Robert P. McGee, 4th Tk Bn, 1st Armd Div, Fort Polk, Louisiana; MSgt Frank Richichi, H&S Co, 252d Tk Bn, NJNG, New Brunswick, N. J.; Pvt Charles Toyzan, Co B, 36th Armd Inf Bn, 3d Armd Div, Fort Knox, Kentucky; PFC Jean L. Giguere, Hq Co, 1st Bn, 11th Armd Cav, Fort Knox, Kentucky.

Associate Armor Company Officer Course Class Nr 2

1st Lt Jack W. Gould, 4th Armd Div, Fort Hood, Texas; 1st Lt Thomas R. Fowler, H&S Co., 25th Recon Bn, 4th Armd Div, Fort Hood, Texas; 1st Lt Donald K. Tester, Co I, 116th Armd Cav, Ida NG, Gooding, Idaho.

Armor Motor Officer Course Class Nr 2

WOJG J. B. Robbins, Jr., Hq, H&S Co, 230th Rcn Bn, Tenn NG, Cookeville, Tenn; WOJG Claudy C. Gregory, Hq, H&S Co, 243d Tk Bn, Ky NG, Bowling Green, Kentucky; 1st Lt Paul G. Lewis, Co A, 139th Tk Bn (90mm Gun), Ind NG, Bedford, Indiana.

Armor Track Vehicle Maintenance Course Class Nr 16

Sgt Leroy N. Overstreet, Hq & Hq Co, CCC, 40th Armd Div, Calif NG, Pasadena, Calif; PFC Frank Darmody, 550th Tk Co, Fort Benning, Georgia; PFC John P. B. Andersen, Hq & Hq Co, CCC, 40th Armd Div, Calif NG, Pasadena, California.

Armor Communication Officer Course Class Nr 2

1st Lt Robert W. Wells, 11th Armd Cav, Fort Knox, Kentucky; 1st Lt John F. Brownfield, 3d Inf Div, Fort Benning, Georgia; 1st Lt Malcolm E. Craig, Jr., 894th Tk Bn, Fort Knox, Kentucky.

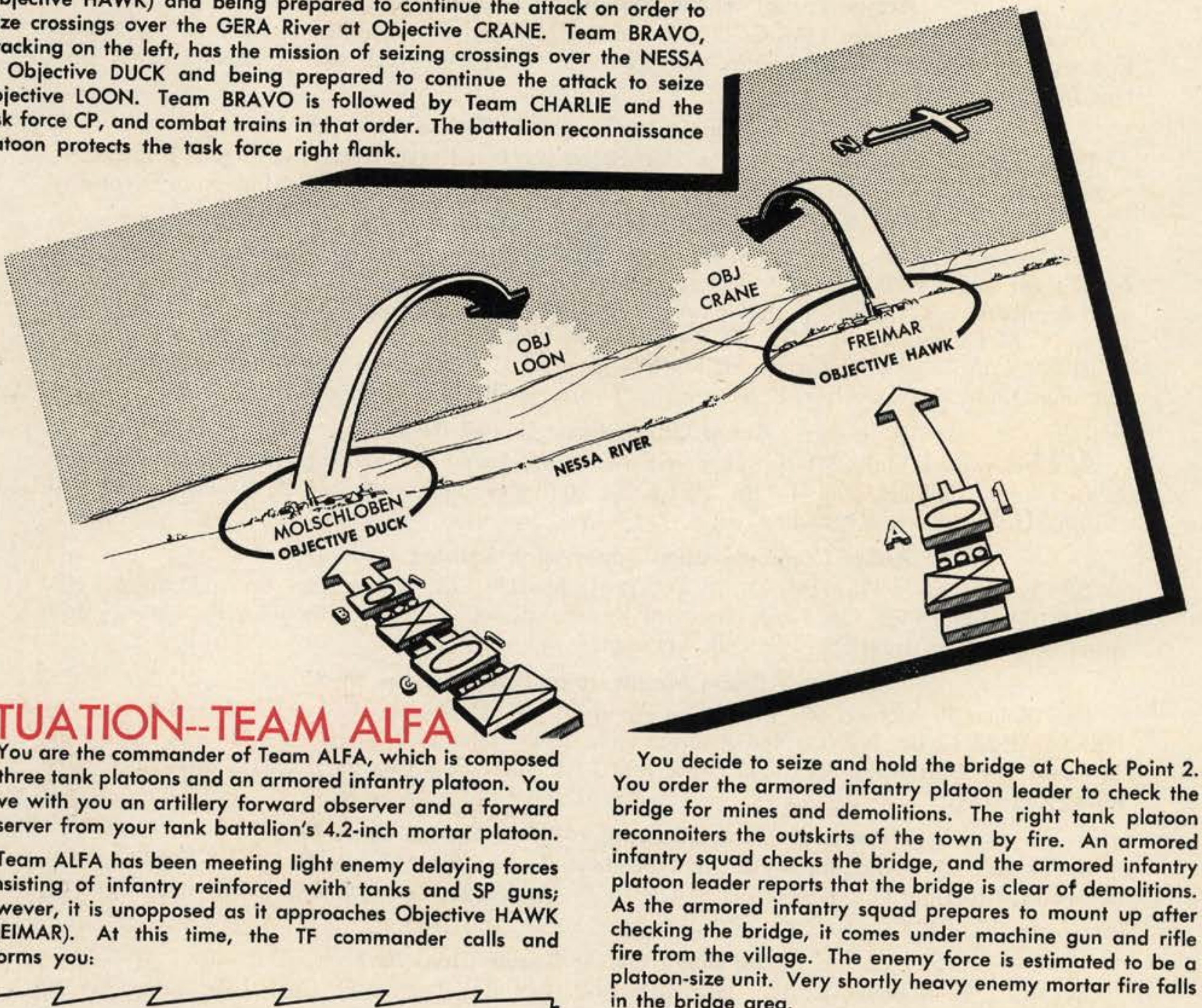
HOW WOULD YOU DO IT?

AN ARMOR SCHOOL PRESENTATION

SITUATION--TASK FORCE 1

Following a breakthrough of enemy defenses, Task Force 1 is now exploiting rapidly to the east. Its mission is to seize crossings over the NESSA River and be prepared to continue the attack to seize crossings over the GERA River.

Task Force 1 is attacking with two teams abreast. Team ALFA, on the right, has the mission of seizing crossings of the NESSA vicinity FREIMAR (Objective HAWK) and being prepared to continue the attack on order to seize crossings over the GERA River at Objective CRANE. Team BRAVO, attacking on the left, has the mission of seizing crossings over the NESSA at Objective DUCK and being prepared to continue the attack to seize Objective LOON. Team BRAVO is followed by Team CHARLIE and the task force CP, and combat trains in that order. The battalion reconnaissance platoon protects the task force right flank.



SITUATION--TEAM ALFA

You are the commander of Team ALFA, which is composed of three tank platoons and an armored infantry platoon. You have with you an artillery forward observer and a forward observer from your tank battalion's 4.2-inch mortar platoon.

Team ALFA has been meeting light enemy delaying forces consisting of infantry reinforced with tanks and SP guns; however, it is unopposed as it approaches Objective HAWK (FREIMAR). At this time, the TF commander calls and informs you:

> Air observer reports five enemy tanks on high ground 3000 yards east of Check Point 3, proceeding toward HAWK. Secure bridge at HAWK and hold it until relieved by Task Force 121. Leading elements of TF 121 are at Check Point 6 (5 miles to the west).

You decide to seize and hold the bridge at Check Point 2. You order the armored infantry platoon leader to check the bridge for mines and demolitions. The right tank platoon reconnoiters the outskirts of the town by fire. An armored infantry squad checks the bridge, and the armored infantry platoon leader reports that the bridge is clear of demolitions. As the armored infantry squad prepares to mount up after checking the bridge, it comes under machine gun and rifle fire from the village. The enemy force is estimated to be a platoon-size unit. Very shortly heavy enemy mortar fire falls in the bridge area.

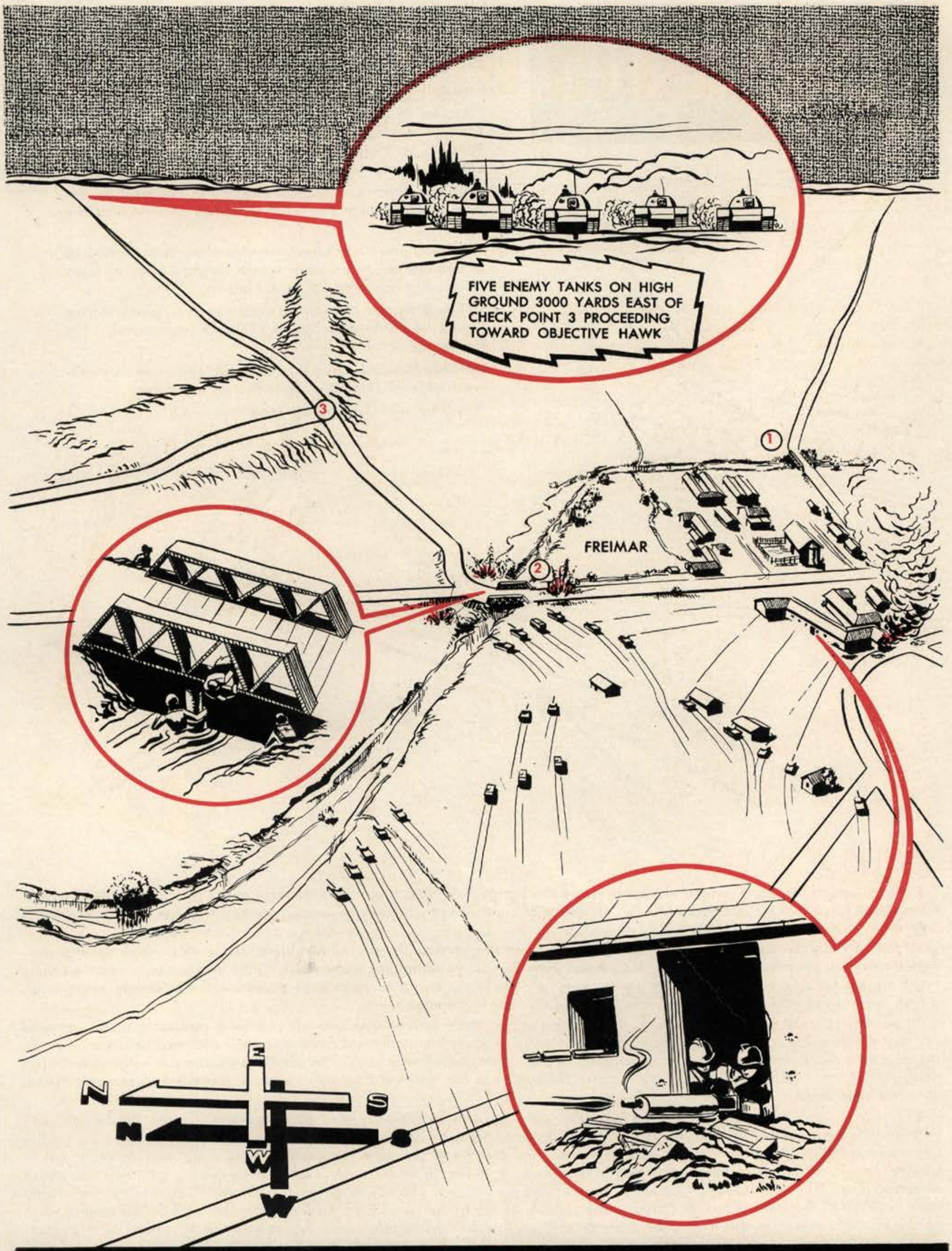
Task Force 121 has reorganized following its penetration of the enemy main defenses, and its leading teams are about 4 to 5 miles behind you.

Remember—As the commander of Team ALFA, your mission is to secure a bridge at Objective HAWK and hold it until relieved by Task Force 121.

HOW WOULD YOU DO IT?

AUTHOR: CAPT H A TURNER JR

ILLUSTRATED BY MR J H BAIN


FIVE ENEMY TANKS ON HIGH GROUND 3000 YARDS EAST OF CHECK POINT 3 PROCEEDING TOWARD OBJECTIVE HAWK
③
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FREIMAR
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SCALE

Solution

1. Report the situation to the task force commander.
2. Transmit the following orders:

"1st and 2d Tank Platoons, cross bridge and proceed as rapidly as possible to the high ground vicinity Check Point 3: 1st Platoon on the right, 2d Platoon on the left. Engage enemy tank force advancing toward FREIMAR.

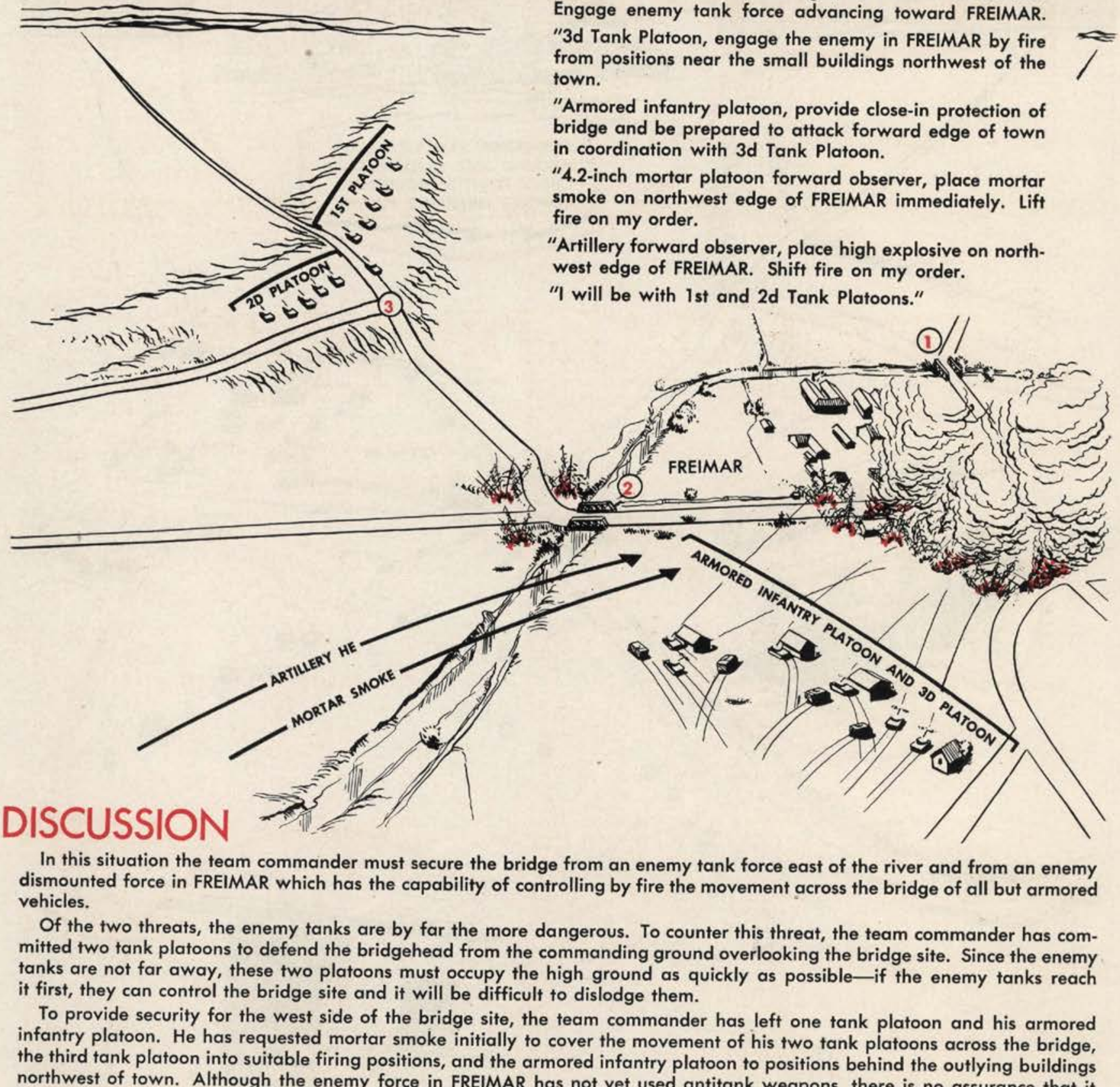
"3d Tank Platoon, engage the enemy in FREIMAR by fire from positions near the small buildings northwest of the town.

"Armored infantry platoon, provide close-in protection of bridge and be prepared to attack forward edge of town in coordination with 3d Tank Platoon.

"4.2-inch mortar platoon forward observer, place mortar smoke on northwest edge of FREIMAR immediately. Lift fire on my order.

"Artillery forward observer, place high explosive on northwest edge of FREIMAR. Shift fire on my order.

"I will be with 1st and 2d Tank Platoons."



DISCUSSION

In this situation the team commander must secure the bridge from an enemy tank force east of the river and from an enemy dismounted force in FREIMAR which has the capability of controlling by fire the movement across the bridge of all but armored vehicles.

Of the two threats, the enemy tanks are by far the more dangerous. To counter this threat, the team commander has committed two tank platoons to defend the bridgehead from the commanding ground overlooking the bridge site. Since the enemy tanks are not far away, these two platoons must occupy the high ground as quickly as possible—if the enemy tanks reach it first, they can control the bridge site and it will be difficult to dislodge them.

To provide security for the west side of the bridge site, the team commander has left one tank platoon and his armored infantry platoon. He has requested mortar smoke initially to cover the movement of his two tank platoons across the bridge, the third tank platoon into suitable firing positions, and the armored infantry platoon to positions behind the outlying buildings northwest of town. Although the enemy force in FREIMAR has not yet used antitank weapons, there is no assurance that it does not have them.

Since his mission does not require that he clean out the town of FREIMAR, but that he merely secure the bridge until relieved in a matter of 20 to 30 minutes, he has elected initially to neutralize and if possible eliminate entirely the enemy fire coming from FREIMAR by the fires of a tank platoon and the fire of his supporting armored field artillery. In order not to become heavily engaged in village fighting and in order to keep his entire team available to quickly continue the attack eastward when relieved by TF 121, he has not committed his armored infantry to attack the village. Only in case the enemy force in FREIMAR becomes a serious threat to the security of the bridge would the armored infantry platoon be employed in an attack of the town. In this event, the armored infantry platoon would move mounted around the right flank of its present position and advance under the covering fires of the tank platoon to a point close to the houses. From that point it would conduct a dismounted attack with the close support of the tank platoon.

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COLONEL GENERAL KURT ZEITZLER

THE BATTLE OF STALINGRAD

GENERAL HASSO VON MANTEUFFEL

THE BATTLE OF THE ARDENNES

U. S. Army

U. S. Army

THE REVIEWER

General Charles L. Bolte served in World War I with the 4th Infantry Division. Between the Wars he attended the usual schools and held various positions with Infantry units including a tour in China. After attending and instructing at the Army War College he was assigned to London. During World War II he commanded the 34th Infantry Division in Italy. Following the War he was assigned to Army Ground Forces, later the Department of the Army. He was next assigned to Europe to Seventh Army, then as CG USAREUR. He returned to Washington as Vice Chief of Staff, Department of the Army until his retirement.

THE FATAL DECISIONS

Edited by
Seymour Freiden
and
William Richardson

With running commentary by Lieutenant General Siegfried Westphal.

302 pp. William Sloane Associates. New York. $4.00.

Reviewed by
GENERAL CHARLES L. BOLTE, Ret.

Any effort to expatiate upon Slam Marshal's excellent foreword to this book would be futile in the light of his deserved reputation as a battlefield commentator and military historian. However, the value of this book to the student of the events of World War II and to the individual preparing himself and his forces against future eventualities warrants an extensive analysis. Outstanding among all the impressions one receives from reading the frank and intimate accounts by the German generals who have recorded their views and their memories herein, are the very frequent comments, which might better be called recriminations, upon those characteristics of Hitler's dictatorial decisions which are almost unbelievable in military circles, let alone in those of the German military hierarchy. The recurrence of such concepts, or lack thereof, as "infatuation with rigid defense," "obstinacy," "vice of overextension," "halfway measures," "compromise," "defer decision," and "wait until the situation matures," makes it seem almost incredible that any national military force could have endured for so long under such conditions.

If a book of this kind is to be of any value, other than of absorbing interest to the millions who fought in the battle it records, that value should lie in the lesson of preventive measures against future major defects in leadership and overcontrol as those so repeatedly recorded in the accounts of which this book is composed. The so-called lessons which can be drawn from the accounts of the tragic decisions, or lack thereof, which resulted in such castastrophic losses of men and matériel make it seem almost incredible that a nation denied outside sources of supply could endure so long at war. It may be trite to call attention to the repeated tales of inadequate supply, received too late or not at all, the importance of roads and railroads and of protection against air attack. But these have always been with us and will be to the extent they are not foreseen and overcome, at least in part, in the future.

Some years ago, in the thirties, an Army War College student, who was an aviation enthusiast, scornfully critized the annual ten-day ride over the battlefields of 1861-65 in the eastern theater of the war. Referring to the second battle of Manassas, he averred that with the eyes of modern aviation such success through the principle of surprise as Lee attained would be impossible. Yet Montgomery surprised Rommel's forces at El Alamein. And despite the air superiority and modern intelligence on the allied side, the Bulge was a surprise in many of its aspects. This book reiterates the proven principle that surprise will always play an important part in the attainment of victory when properly and skillfully employed.

When General George C. Marshall was the Assistant Commandant of The Infantry School in the twenties, he constantly emphasized the overriding necessity of focusing attention on the "study of the first six months of the next war." That is the period of confusion, frustation, errors and incompetencies which greatly affect, if not determine, the subsequent course if not the ultimate outcome of the war. While this book is not limited to that period, nor for that matter even focused thereon, the most fatal of all fatal decisions was made at that time, decisions which even Hitler, with his megalomaniac belief in his intuitive clairvoyance, could not see made certain the defeat of Germany.

Twice have the German leaders wrongly estimated that the United States would not fight, or, if they did, it would be a case of too little and too late to affect the outcome of the war. Again was British determination misjudged by Germany. On such basic errors were the original fatal decisions made.

Two points especially impress the military reader. Despite the concept of "Führerheit," with the dictator supreme, there was not unity in the German command structure, land, sea, and air-wise, and most glaringly—regular and SS-wise. Hitler's partiality to the SS troops, and their fanaticism and frequent military incompetence did not sit well with the regular professional.

The second point, made in several places in the book, emphasizes how great is the influence on fighting ability and morale, of troops being well-fed, well-clothed and well-equipped. This should support a cardinal principle in the maintenance of American forces.

There is one great milestone which marks the final collapse of the German forces and the German nation. That is the loss of faith in their leaders and the consequent deterioration of morale. Troops who have faith in their commanders and in the wholehearted determination of the people at home to back them up on the battlefield, can accomplish miracles. Loss of that faith is inevitably disastrous. This, it would seem, is the basic lesson of this book.

General of the Air Force Werner Kreipe. Served in bomber unit K G 2, December 1939—June 1940. Then appointed Chief Operations Officer, Third Air Fleet. Later held other staff appointments on Western Front and in Russia. Appointed Chief of the German Air Staff, 1944.

General Gunther Blumentritt. Chief of Staff, Fourth Army, 1940-1942. Chief of Operations Department, High Command, January 1942. Chief of Staff, Army Group D, 1942-1944. General of the Waffen SS, 1944-1945. Commander, 25th Army, January 1945. Assumed command, 1st Parachute Army, March 1945.

Lieutenant General Fritz Bayerlein. Operations Officer, Panzer Group Guderian, France, 1940. Operations Officer, Guderian's Panzer Group 2, Russia, 1941. Chief of Staff, Afrika Korps, September 1941. Chief of Staff to Rommel, Summer, 1942 to early 1943. Commander 3d Panzer Division, 1943, and Panzer Lehr Division, January 1944.

Colonel General Kurt Zeitzler. Chief of Staff, XXII Corps, 1940-1941. Chief of Staff, Army Group D, April 1942. Chief of Army General Staff from late 1942 until July 1944. Replaced after attempted assassination of Hitler.

Lieutenant General Bodo Zimmerman. Retired in 1920, recalled to the General Staff in 1939. Chief Operations Officer to Commander-in-Chief West, 1940-1942, and of Army Group D from then until the German surrender.

General Hasso von Manteuffel. On the staff of the Inspectorate of Panzer troops before the war. Commanded a division in Tunisia, 1943, then took over 7th Panzer Division. Appointed commander of "Grossdeutschland" Panzer Division, February 1944. Appointed commander of Fifth Panzer Army, 1944, and commander of Third Panzer Army in East Prussia, March 1945.

In order to keep our members posted on worthwhile material that we believe can assist them in pursuing their military endeavors, we have extracted some pertinent paragraphs from this Guide which is primarily for Company Commanders. From the comments we have received from various members, the Guide assists noncommissioned officers as well as tank unit commanders. These comments have been voluntarily submitted from members of National Guard units and the Regular Establishment. Majors Roy Moore, Jr. and John K. Brier, the authors, developed their thoughts on this subject after years of command experience at the company level. To assist the younger officer to better perform his job was their aim in having this handy guide published. ARMOR *is pleased to bring you these extracts from . . .*

TANK COMPANY COMMANDER'S GUIDE

COMMANDERS of newly activated tank companies and new company commanders are immediately confronted with two major problems: the administrative organization of their company and its combat training. Unfortunately, the latter problem, combat training, although paramount in importance, cannot be successfully achieved by a commander without efficient administration. *Tank Company Commander's Guide* seeks to advise and aid the tank company commander by carefully delineating the duties and responsibilities of all key company personnel and to provide certain other administrative techniques which experience has proved sound.

Obviously the company commander cannot personally perform all the many company activities for which he is responsible. He must rely heavily on his officers and noncommissioned officers in order to achieve the maximum combat effectiveness in his company.

That which follows in this short article is a compilation of extracts from the *Guide,* pertaining to some of these activities.

Tank Platoon Leader

THE tank platoon leader willingly aids and guides the planning of each class conducted by noncommissioned officers of his platoon, and when time permits, attends their rehearsals. A platoon leader can do much to improve training and to dispel an NCO's fear of instructing, by announcing and enforcing the following policy:

> No more than five minutes of any training hour conducted by an NCO will be devoted to lecture type instruction. The bulk of the training time will be spent in supervised application. Soldiers learn more by doing than by listening.

The platoon leader insists that the noncommissioned officers of his platoon fully carry out their functions of command and that they present at all times an example of good soldiering.

Observing, advising, correcting and commenting—*i.e.,* inspecting—can be wasteful of time and irritating unless the inspections are "directed." Direction of daily informal inspections is gained by using the following check list:

1. Are the men being inspected carrying out their mission? Emphasize to the men the sacred nature of a given mission for the sake of combat efficiency.
2. Is the work organized?
3. Is the proper state of discipline evident?
4. Is the area policed?
5. Is property being safeguarded?
6. What is being done that is commendable?
7. What are the major deficiencies?

The average soldier reacts favorably to criticism if it is specific criticism accompanied (if deserved) by some recognition of work well done. Experience proves that praise should precede censure.

Platoon Sergeant

IT should be a matter of personal pride to the platoon sergeant that he is able to answer correctly the many questions asked him by his men.

The platoon sergeant must realize the wisdom and necessity of being loyal to his commanders and encouraging loyalty within the platoon.

The development of a good group of NCO's is a goal of the platoon sergeant. That goal can be gained only through training. Most soldiers more or less blossom when given responsibility. Extra training mentioned in the *Guide* affords the platoon sergeant an excellent chance to train NCO's within the platoon. Use junior enlisted men as assistant instructors to develop their ability—to accustom them to the feeling of being a leader—to permit them to develop confidence in themselves.

The Tank Commander

THE tank commander commands the crew of the tank to which he is assigned. He is primarily a combat leader, must possess positive qualities of leadership and accordingly be aggressive, resourceful and professionally competent.

He is responsible to his platoon leader for maintaining proper standards of discipline in his crew, for much of its training, for supervising the care, cleaning and maintenance of his tank together with all other equipment and clothing of the men of the crew.

He instructs his crew in such basic subjects as the school of the soldier, crew drill, first aid, personal hygiene, military courtesy, visual signals, display of equipment, field expedients, interior guard duty, care and preservation of personal arms, equipment and uniform, and preparation for inspection. (Preparation for inspection requires the sergeant to hold his own inspection before the inspection scheduled by one of his seniors. That pre-inspection must be finished in time for corrective action.) The tank commander must learn to teach by using the application technique of instruction. . . . Crew drill done with snap and perfection is a must if the tank commander is to have an efficient crew.

It is especially important that newly assigned crew members be given detailed instruction by their tank commander in such basic subjects as care and cleaning of the uniform, beds and lockers.

In order to facilitate the many details of maintaining his tank, the tank commander divides the bulk of the work into duties and assigns them to specific crew members. This system must be flexible in order to achieve teamwork.

Summary

THE tank company commander must rely heavily on his officers and noncommissioned officers in order to achieve the maximum combat effectiveness in his company. *Tank Company Commander's Guide* by Majors Roy Moore, Jr. and John K. Brier, offers aid to the officer who is attempting to develop superior NCO's and to those other valuable tankers who are attempting to become superior NCO's.

The prices as advertised in the March-April issue still prevail. Individual copies are $1.00; 5 thru 10 copies are 90 cents each; 11 thru 25 copies are 80 cents each, and over 25 copies the price is 75 cents each. Postage is prepaid when remittance accompanies the order.

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STILWELL'S COMMAND PROBLEMS

by

Charles F. Romanus and Riley Sunderland

The reader of this book, following the tangled reins of command held by General Joseph W. Stilwell, may sometimes wonder if the maxim is always true. To fight the coalition war, Stilwell had a complex array of tasks to perform—and a resounding list of titles to match. He was Commanding General, United States Army Forces, China, Burma and India Theater of Operations; he was Deputy Supreme Allied Commander, Southeast Asia; he was Commanding General, Chinese Army in India; he was Commanding General, Northern Combat Area Command. In these roles he had to conduct the North Burma Campaign and provide its immediate logistical support; he had to execute a number of projects to aid China agreed to by the President of the United States, the Prime Minister of Great Britain, and the Generalissimo of China; he had to carry out projects ordered by the U. S. Joint Chiefs of Staff to reinforce U. S. operations in the Pacific and provide for their logistical support; he had to hold himself in readiness to play whatever role necessity might demand of him in the Southeast Asia Command.

Many strong personalities flavor the pages of this book. Besides the colorful Stilwell himself, such diverse figures as Admiral Mountbatten, Generals Chennault, Hurley, Merrill and Wingate, Generalissimo Chiang Kai-shek, as well as Madame Chiang, reenact events which, though more than a decade old, still stir strong emotions today. In bringing these events to life the authors have had access to Stilwell's personal diaries, Hurley's papers, and many other documents.

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LETTERS TO THE EDITOR

L. to R.: Lt. Col. Douglas, Col. Jones, Gen. Johnson, Sgts. Kersten, Ellzey, Stark.

Associate Membership in the Association

Dear Sir:

Please accept one year Associate memberships in the Association in the names of the following honor graduates of the 157th Tank Battalion Noncommissioned Officer Academy.

MSgt Robert C. Kersten
MSgt Paul E. Ellzey, Jr.
SFC Roy E. Stark

In the picture Major General Albert S. Johnson, Commanding General, 49th Armored Division, Texas National Guard, is making the presentations.

2D LIEUTENANT JAMES E. PARKS, JR.
157th Tank Battalion
PO Box 15114
Houston 20, Texas

More on Lesson Plans

Dear Sir:

The July-August issue of *ARMOR* carried a letter to the editor from a Lieutenant Parks on the subject of lesson plans.

Your editorial comment has missed the point. I am sure the writer was referring to lesson plans for ATP training and not Armor School course lesson plans.

There are no uniform universally available lesson plans for ATP subjects. The problem of getting well written lesson plans is extremely difficult in National Guard Units because of the limited available training time.

Army ATP subject schedules are now in preparation and are a valuable aid to training but are no substitute for a lesson plan. They would be a logical and convenient means of providing lesson plans which could be added to or incorporated in the subject schedule.

The argument that each instructor should prepare his own lesson plan as part of prior preparation is outweighed by the loss of valuable time in duplication of effort. The time gained with a ready-made lesson plan could be more profitable added to reference study, training and rehearsals.

Although a project of considerable magnitude, the provision of ATP lesson plans with subject schedules would achieve more uniformity in subject training and save many hours of the instructor's time.

COLONEL ROBERT H. COLWELL

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Rates: See bottom of contents page.

Senior Unit Advisor
49th Armored Division
PO Box 13111, Dallas 20, Texas

Models of Fantastic Features

Dear Sir:

I read with a great deal of interest an article in your March-April 1956 issue entitled *Fantastic Features of Future Warfare* by Lt. Col. Robert D. Rigg.

I though you would be interested in knowing that the Hiller Flying Platform is now being produced in a miniature model by the Wen-Mac Corporation. This platform, as you know, is one of the exciting weapons of the future.

The management of the Wen-Mac Corporation has worked closely with Hiller Helicopter Company in the development of this engine-powered model. It promises to be one of the most exciting toys ever introduced on the American market. It is powered by a real internal combustion, one-cylinder engine. The Hiller Flying Platform rises vertically . . . darts from side to side . . . hovers in space!

I would also like to take this opportunity to say that I think you have a most interesting, instructive and enjoyable magazine. I thoroughly enjoy reading it.

MR. BOB STROCK

Sales Manager
Wen-Mac Corporation
11511 Tennessee Ave.
Los Angeles 64, California

How Long Have You Belonged?

Dear Sir:

In reviewing the card you have sent members indicating their membership in the Armor Association, I find it quite attractive.

There is one way in which you might improve it and also give recognition to the number of years that a member has belonged. A small sticker with the wording to the effect "member_____years" could easily be affixed to each new card issued indicating the number of years the member has been active in the Association. This procedure is followed by the Automobile Club of Southern California and many other organizations. In this case a small sticker could be placed directly under the M of ARMOR of the first line.

The time could go back to when the Association was renamed or encompass the former Cavalry Association.

COLONEL CECIL HIMES

Senior Unit Advisor
40th Armored Division
3440 S. Hope Street
Los Angeles 7, California

● *The idea is well taken. Unfortunately our pay cards do not go back sufficiently to give the accurate information needed to keep up these membership cards. Also, the circulation department, composed of one enlisted man, is kept busy as it is with his daily work, billing periods and constant promotional schemes dreamed up by the Editor.* ED.

ARMOR also has Feminine Appeal

Dear Sir:

This letter concerns a change of address, but first let me tell you how very much *we* enjoy your magazine. My husband is the "tanker" in the family, of course, and I have never seen him look forward to the arrival of a magazine before as he does his issues of *ARMOR*. As for me, he has tried to tell me all about his tanks and had me enthused about them before we began taking the magazine. However *ARMOR* has helped him instruct me and my interest has soared even more. We both enjoy the magazine now more than we can say, and certainly are indebted to you for putting it out. The picture on the first page (Old Bill) reminds me of my great great grandfather who was a captain in the original Tennessee Volunteers Cavalry. I wonder what he would have thought if he could have seen the wonderful machines that have taken the place of his noble horse!

MRS. E. W. ERICKSON

Maple Avenue
Box 153
Spring Valley, N. Y.

THE COVER

The U. S. Army photograph taken near Japan's famous Mount Fujiyama focuses the spotlight on the 70th Tank Battalion of the 1st Cavalry Division. Although the bulk of our Armor is located in another theater, the tank battalions and companies assigned in the Far East, Pacific and Alaska are kept in a high state of combat readiness by their vigorous training and spirited leadership.

TANK COMPANY COMMANDER'S GUIDE

by

Major Roy Moore, Jr.

and

Major John K. Brier

This pocket size booklet is designed to assist the company commander in setting up an efficient administrative organization by delineating the responsibilities and duties of all key company personnel and to provide certain other aids and administrative techniques which experience has proven sound. By judicious application and, where appropriate, modification of the contents of this guide, the tank company commander can rapidly organize his unit, strengthen his chain of command, ease many of his administrative burdens and thereby enable himself to devote greater attention to his primary mission—training his company for combat!

Single copies	$1.00
5 thru 10 copies	.90
11 thru 25 copies	.80
over 25 copies	.75

CARDED

WHAT IS A TANK?

By LIEUTENANT COLONEL CARROLL McFALLS, JR.

IN World War I the art of maneuver all but disappeared from the battlefield. Firepower, in the form of massed artillery and the machine gun, was supreme. Opposing forces settled down into static trench warfare. Limited advances were made only after the expenditure of enormous quantities of artillery shells and machine gun bullets. Even then the price paid in lives for a few yards of ground was appalling. During these advances it was seldom possible to use any form of maneuver except for the frontal attack geared to the speed of the walking soldier following a rolling barrage. True flank attacks were a gamble for they allowed the machine gun its greatest advantage, the capability of employing enfilading fire. Firepower had subordinated maneuver because of firepower's domination of mobility. Because of this domination the application of shock action as the result of combining mass and maneuver was practically impossible.

All belligerents were aware of their inability to employ skillful maneuver; all recognized that firepower's dominance of mobility, and consequently, shock action, was the cause; all desperately searched for a means of re-introducing maneuver to warfare.

In the Fall of 1916 the Allies unveiled, prematurely, their answer to the question of the re-introduction of maneuver to the battlefield. In the Fall of 1917 at Cambrai, France, they applied their solution and the results were decisive. Their solution was simple; it was not new, having been used for centuries; it was a modern version of the knight in armor; it was the tank. Firepower was protected by armor plate and mounted on a mobile carrier. The lance and sword were replaced by the machine gun and light cannon; the horse was replaced by the internal combustion engine. As was true of the knight in armor the tank was a compromise between three

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LIEUTENANT COLONEL CARROLL McFALLS, JR., Armor, served in Europe during World War II as a Platoon Leader, Company Commander and Operations Officer in the 30th Infantry Regiment, 3d Infantry Division. During the Korean hostilities he commanded the 70th Tank Battalion, 1st Cavalry Division. He is now the Chief, Combat Vehicle Section, Board Nr 2, Fort Knox.

ARE THESE TANKS?

The tank is the toughest design problem of any of the war machines. Logistical considerations such as the restrictions on size, weight and shape; rail and ship transportability of the end item; cost in money and critical materials; and many other factors are problems which must be solved in any final tank design.

U. S. Army

essentials, i.e., firepower, mobility and armor protection. Thus did maneuver return to the battlefield. Once again armies were able to maneuver forces in the face of enemy fire. This capability of maneuver reached a high state during World War II. Perhaps in no other war were firepower and maneuver so nearly equal and under this impact the tank was developed to a high degree of perfection.

Since World War II firepower has again taken a long stride forward, perhaps the ultimate stride, with the development and standardization of a wide range of nuclear weapons. Once again an answer is being sought to the question of maneuver. The tank plays an integral part in most proposed solutions to this question. It plays this part because it alone possesses to the necessary degree each of the qualities required to permit maneuver on the battlefield, i.e., firepower, mobility and armor protection. This then is the true answer to the question of what is a tank. A tank is a machine of war which is able *within itself* to maneuver on the battlefield in the face of enemy fire and to deliver fire against the enemy at a time and place of its own choosing. A tank is a compromise between firepower, mobility and armor protection. Reduce drastically or eliminate any one of the component parts of this compromise and a tank it ceases to be. It may become an assault gun, or a reconnaissance vehicle, or a utility vehicle, or a personnel carrier, or many other things but it is no longer a tank.

Despite the fact that a tank is a compromise between the essentials of firepower, mobility and armor protection, and is, therefore, a difficult problem for the designer, there are those who would ease this design problem by compromising one or more of the essentials completely out of the picture. These persons can be divided into three general schools of thought. (Actually, it is difficult to classify any one of them into a single group since their ideas are overlapping in many instances. As an example, the happy warrior who desires invulnerable armor protection at no penalty in weight.) These three general schools are directly tied to the essentials which comprise the tank. They are *The Heavy Firepower School, The High Speed School,* and *The Heavy Armor School.* The latter group are the ones who would make the tanker immortal by shielding him in armor invulnerable to all enemy fire at the price of firepower and mobility.

Heavy Firepower

Let us assume that, in turn, each of the above schools had the final word in tank design and project the resulting product onto the atomic battlefield. The product of the heavy firepower school would be a vehicle mounting a heavy caliber cannon. Mobility and armor protection would be sacrificed to obtain superior firepower. On the atomic battlefield this vehicle would be valuable in the delivery of heavy fire against located targets. It would, in other words, be valuable in breaching an enemy position since it could deliver heavy projectiles at relatively long ranges. It would be of little use in exploitation of the breach since its light armor would render it vulnerable to most types of enemy fire. Nor would such a vehicle be capable of shock action. Such a vehicle would probably be a good armored artillery piece; it would not be a tank. Such a vehicle could not exploit an atomic strike.

Vehicle	Weight	Rated Top Speed	Average Speed Attained
M59, Armored Personnel Carrier	**20.9 tons**	**32 MPH**	**9.0 MPH**
M41A1, Light Tank	**25.9 tons**	**35 MPH**	**9.5 MPH**
M48, Medium Tank	**52.0 tons**	**28 MPH**	**8.9 MPH**
T43E1, Heavy Tank	**62.8 tons**	**21 MPH**	**8.2 MPH**

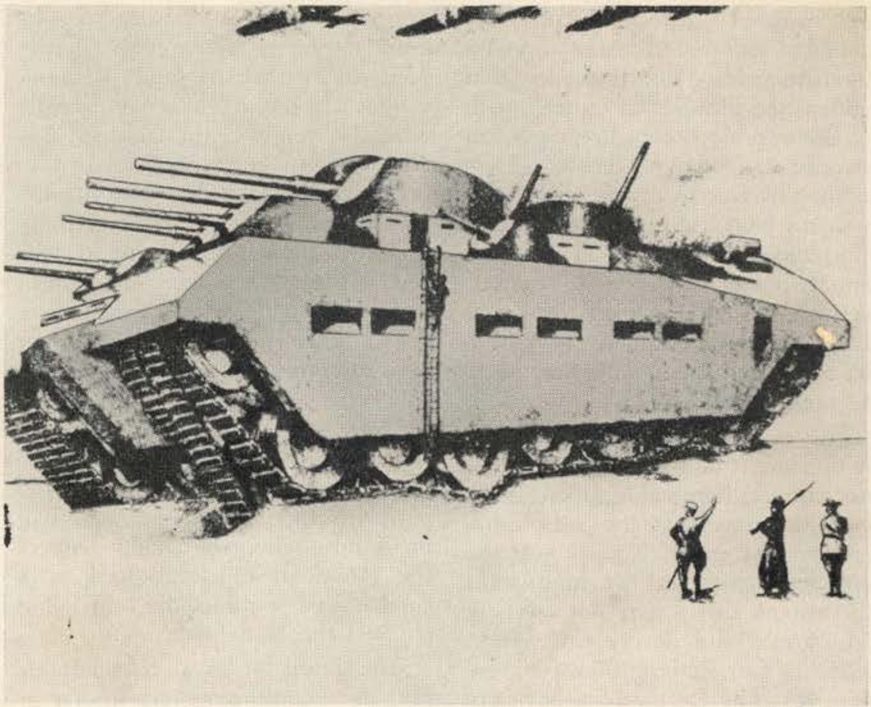
High Speed

The high speed school would produce a greyhound, good for chasing a scared rabbit but of no use in a bulldog type of a close and destroy slugging match. This school would flood the battlefield with agile, highly mobile vehicles under the impression that these vehicles could rely upon high speed to offset their inadequate armor protection. They would have to mount a light gun in order to save weight. Such a vehicle would rely upon nuclear and other firepower to make the breach in the enemy position; it would then be committed to exploitation; it would fail. It would fail because even at a speed of 40 miles per hour it could not outrun the target tracking speed of enemy tanks. Recent tests have revealed that our present turret control systems are capable of tracking a target whose dimensions are 4½ feet x 4½ feet 100 percent of the time on a straight crossing course at a range of 300 yards and at a speed of 40 miles per hour. It should be noted that this target dimension is less than the presented frontal area of any known tank, foreign or domestic. As the range is increased, the tracking task becomes easier. Recent tests have also revealed that the capability of a combat vehicle to attain high speed on a road does not automatically give that vehicle a high speed cross country capability. In order to obtain high speed the horsepower to weight ratio of a vehicle must be very high. This normally means a vehicle of light weight. A light weight vehicle is more sensitive to the profile of the ground than is a heavier vehicle since it must ride over small irregularities which a heavier vehicle may press flat. It is more prone to pitch. This pitching reaches such a magnitude that the crew are unable to perform any of their crew functions long before the top speed of the vehicle is reached. To demonstrate this a special test was conducted at Fort Knox, Kentucky, by Board Nr 2, CONARC, in the Summer of 1955. A cross country course 3½ miles in length was laid out. Four vehicles were used and crews were rotated through each vehicle. An officer commanded each crew. His instructions were to operate the vehicle across this course at the maximum speed attainable and still allow the crew to perform their crew functions. To the uninitiated the results were amazing and are summarized in *Figure 1*.

U. S. Army

Heavy Firepower—Is this a tank?

This test proved that the attainable top cross country speed of a vehicle was not solely the result of its rated top speed nor its horsepower to weight ratio but was the result of the stability and ride characteristics of the vehicle and of the ability of the vehicle and its crew to withstand violent motion and shock. As a result of this test it can be readily seen that a so-called high speed vehicle and a relatively low speed vehicle are exposed to antitank fire approximately the same amount of time provided each traverses the same exposed cross country area in an operational manner. And since tactics dictate that hostile antitank guns, or tanks, which are sited to deny the use of roads, be attacked cross-country, the attacking high speed vehicle can make little use of its high speed capability once it leaves the road.



Heavy Armor—Is this a tank?

U. S. Army

A word of caution regarding the results of the Board Nr 2 test needs be injected here for the slip stick designers who delight in solving complex problems with a flip of the fingers. The results of the cross-country test cannot be extended by extrapolation to include a vehicle with an absurdly low top speed in the 5-10 miles per hour range. It is obvious that such a vehicle would require a much longer time to cross the same area than would a light vehicle. It is also obvious that such a low speed vehicle has no place on the atomic battlefield.

This high speed vehicle would be of limited use on the atomic battlefield. It could not be used to good advantage to punch a hole in the hostile defenses because of its light gun and once it was forced off the road during the exploitation phase it would be no match for an enemy tank. To prove this point one has but to look to Korea and the complete supremacy of the T34/85 over the M24 in a tank versus tank engagement. This product of the high speed school might be a good reconnaissance vehicle; it cannot be classed as a true tank.

The Tank

Conceived in the blazing heat of the steel mills,
Nurtured by the flaming liquid that flows
From the kettles of open hearths and furnaces;
Born to a hydraulic press's blows.
Shaped in infancy by tireless workers
Wielding rivet gun, hammer, and crane;
Through adolescence taught mechanized battle,
Mobility and firepower; through sun, wind, and rain,
Young manhood was spent in travel
By railroad, ship, and armored van,
Reached maturity on the field of conflict
Responding to orders given by man.
Middle years were spent in combat;
Old age comes and with it pain
Caused by projectiles tearing out vitals,
Conceived in fire . . . died in flame!
Returned as scrap metal to the old homeplace,
The wheel has turned just one full span,
And like the Phoenix from its ashes,
There arises another to fight again.

Lieutenant Colonel Carroll McFalls, Jr.

Heavy Armor

The heavy armor school desires a land battleship. They would produce a vehicle so heavily armored as to render it invulnerable to all but the largest antitank weapons. To do this they accept great weight (80-90 tons) at the cost of mobility. On the atomic battlefield this vehicle is capable of use in breaching operations but once committed to the exploitation it becomes a liability because of its sensitivity to terrain especially to bridges, embankments and small streams. Again the result is a fine assault gun, it is not a tank.

A Compromise

Since the combat vehicle product of each of the three mentioned schools of thought is not a tank, a fourth school has evolved. This school is composed mostly of discouraged and disenchanted former members of one of the preceding three schools. Or perhaps this school can be more accurately compared with a graduate school since it is composed of individuals who have "learned their lesson" in one of the other schools. The author, for example, is a refugee from the high speed school. This fourth school may be termed the *Compromise School*. They believe that a tank is a tank because of its ability to provide mobile, armor-protected firepower on the battlefield. They recognize that perhaps the ultimate in either mobility, armor protection or firepower can never be attained in one vehicle. They accept this fact in order to obtain a vehicle which has varying degrees of effectiveness in any *one* of these essentials but which, over-all, is an effective combination of all the essentials. A compromise between mobility, armor protection and firepower: *the tank.*

The essential most often attacked by opponents of this school is armor protection. A familiar argument is the one which states that since we cannot, with present armor plate, protect the tank against large caliber, high velocity antitank shells, why not use very light armor and devote the weight saving to gun, ammunition, fuel, engine, etc. The fallacy of this theory is threefold: First, our present medium tank is relatively invulnerable to a wide range of enemy weapons from the pistol and rifle up to and including light artillery and light antitank weapons. Thus, our present medium tank is invulnerable to the mass of weapons found in the enemy division. Any appreciable reduction in armor protection allows more of the enemy's weapons, to include non-antitank weapons, to become effective with no increase in their quality. This presents the enemy with an answer free of charge to his problem of how to stop our tanks.

Second, if we use light armor then the enemy need not devote much time, effort and money to the task of developing large caliber antitank weapons, expensive shaped charges and tanks. In other words we make his research and development task easier.

Third, and most important, light armor prohibits the use of shock action by our own forces. For there is nothing very shocking to the enemy to be faced with a vehicle which he can destroy with a large caliber antitank rifle or the near miss of a heavy mortar. The shocking thing for him is to observe an American tank moving through his defensive barrage, turning his light projectiles and his shell fragments and firing all the while *at him.*

In some quarters the view is expressed that adequate armor results in a vehicle that is "too heavy." The term "too heavy" is never specifically defined. A careful study of tank weight will reveal that it matters little what the weight of the tank is if it is too heavy to be transported by aircraft and is not too heavy to use the bridging provided within the division. Roughly, these weights are 25 tons and 50 tons. Any drastic reduction in armor protection which results in a vehicle that is inadequate in armor protection but is still above the allowable cargo load of aircraft is erroneous. Such a vehicle may provide some economy in production through the use of lighter armor and a smaller power package but this economy will prove false when the enemy reduces the complete vehicle to junk with comparative ease once the vehicle has reached the battlefield.

The desire for an air-transportable tank is a continuing one insofar as the user is concerned. However, the user should not allow himself to be led down the blind alley of accepting air transportability at the cost of inadequate armor protection and/or firepower for such a vehicle will have no sustained combat capability and will not be effective in a tank role on the battlefield.

This then is the compromise school of thought's concept of tank design. It is based on a compromise between the essentials which make a tank a tank. These essentials are firepower, mobility and armor protection. They recognize that the present and forseeable future state of the art will not allow the designer to ignore any of the essentials. Therefore, they believe the designer must provide as much of one essential as is possible without reducing any of the other essentials to the point where they are inadequate. They propose the following approach:

1. Determine the mission the tank is to be assigned on the future battlefield to include the quality and quantity of enemy armor the tank must defeat.
2. Design a gun-ammunition-fire-control system that is capable of accomplishing this mission.
3. Protect the crew of the vehicle against as many of the enemy's weapons as possible. This protection should include as a minimum the main armament of the enemy tank, which is to be defeated at the maximum range at which our gun is effective against the enemy tank.
4. Install a power package which will assure good cross-country mobility.
5. Examine the entire design to determine which essential can be relaxed through the improvement of another. For example, if our gun-ammunition-fire-control combination allows us to penetrate a comparable enemy tank at a certain range while our best estimate is that he must close to a lesser range to achieve a penetration of our tank then we may remove the armor plate from our tank which is equal to the approximate differential in range. (Actually, we should retain a slight advantage if possible.) By removing this much armor plate we may be able to achieve a lighter, smaller tank and use a smaller power package. *This is compromise* yet we have reduced none of the essentials below the danger point.

The author admits that the approach to tank design as presented in this article is over-simplified. This is deliberate in order to deal with essentials. A tank is probably one of the toughest design problems of any war machine in our arsenal. Logistical considerations such as restrictions on size, weight and shape; rail and ship transportability requirements; combat supportability of the end item; cost in money and critical materials; and many other factors are problems which must be solved in the final design. Because it is such a problem is the reason that the user is often urged, and even by members of his own branch, to accept a *tank-like* vehicle instead of a tank; to accept a vehicle lacking in one of the three essentials; to accept a vehicle which will not win. This we must not do for we must attack the enemy on a future battlefield with quality, we cannot match him in quantity. And quality in a tank is the direct result of the designer's skill in finely balancing and incorporating into the vehicle superior firepower, excellent mobility and adequate armor protection. This then is the answer to the question of what is a tank.

What can you do to insure continued effective operation of equipment? How can you establish and maintain high standards of maintenance? These problems confront every commander. The degree of success in fulfilling these objectives will depend on your . . .

DRIVER AND CREW MAINTENANCE

By LIEUTENANT COLONEL ROGER J. TEYSSIER

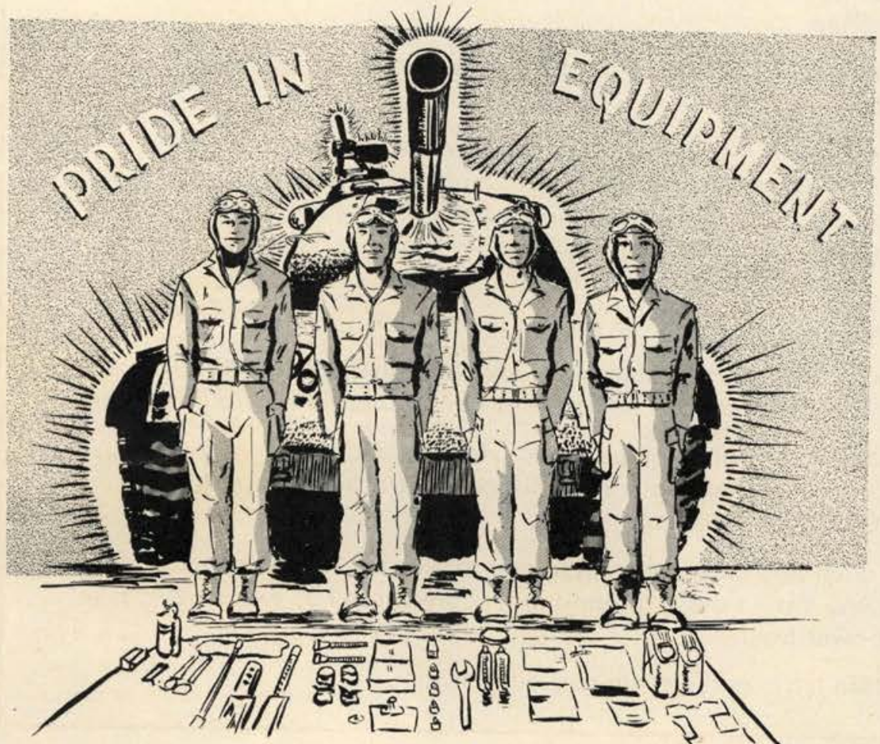
RESEARCH and development have provided equipment for Armor which is more powerful and effective than ever before. However, this advancement has resulted in end-products which are more complex. Proper and adequate maintenance services are a critical necessity if this equipment is to serve its purpose. In this respect, the role of tank crews and drivers is of paramount importance. If firepower, mobility and shock action are to be attained on the battlefield, the users must know how to take care of their equipment. Technical advancement and more effective end-products are of no value unless the equipment is kept operating properly.

What can we, as commanders, do to insure continued effective operation of equipment in our command—how can we establish and maintain high standards of maintenance? These are problems which confront every commander. The degree of success in fulfilling these objectives will depend on the *modus operandi*. The most important action we can take is to initiate an intensive driver and crew maintenance training program. This activity is accurately described as *Preventive Maintenance*—those operations whereby the drivers and crews effect required maintenance services; where they detect incipient failures and take corrective action to prevent breakdowns. A systematic objective approach to the supervision of PM requires consideration of five general factors. The factors which are the basis for a sound crew maintenance program are:

1. Knowledge of the equipment.
2. Availability and adherence to pertinent publications.
3. Pride in equipment.
4. Sufficient time for PM.
5. Recognition for outstanding performance.

Facilities

Supervision



Knowledge of Equipment

Every commander should know the equipment in his command. However, we must be realistic in our approach to *knowledge of the equipment*. It is not intended that the commander be a specialist. He has assigned personnel for this function. It is too gigantic a task to be intimately conversant with all the technical *minutiae*. The commander should know the limitations and capabilities of the equipment, the areas of responsibility of individuals in his command, i.e., what drivers and crews do maintenance-wise and how leaders super-

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LIEUTENANT COLONEL ROGER J. TEYSSIER, Armor, attended Drexel Institute, Philadelphia. During World War II he served in Europe with the 755th Tank Battalion. He returned Stateside to Fort Knox and reverted to civilian life in 1947. Returning to duty in 1948 he was assigned to Fort Dix. He was assigned to FECOM and served with the 70th Tank Battalion, in Korea. He next attended The Armor School and is the Chief of the Integrated Division, The Automotive Department, The Armor School, Fort Knox, Kentucky.

Maintenance and Operation Checks

M48 Medium-Gun Tank

1. TRANSMISSION OIL LEVEL. After stopping vehicle, engine idling at 1000 RPM, check oil level on oil level gage.
2. TRACK ADJUSTMENT. Is correct when a block 1 inch thick between Nr 3 support roller and the track will provide 1/8- to 3/16-inch clearance between the track and Nr 2 and 4 support rollers.
3. TRACK WEDGES AND SPROCKET BOLTS. Check for tightness.
4. UNIVERSAL JOINTS. Check for safety wire lacing of universal joints between the transmission and the final drive.
5. FINAL DRIVE VENTS. Check for breakage. Located in final drive housing next to transmission mountings.
6. CARBURETOR AIR HORN HOSE. Check for air leaks and for tightness of hose clamps.
7. OIL COOLERS. Check for cleanliness and for leaks at connections and lines.
8. ENGINE OIL LEVEL. Check level gage.
9. CONTROL LINKAGE. Verify that pointer on valve body and steering-shifting controls are synchronized. For example, with the shift lever in high the pointer on the transmission valve body should point to HIGH.
10. STOWAGE. Check boxes, exterior, and interior of vehicle to be sure OVM is present and properly mounted or stowed. Driver and fighting compartments should be clean and operational.
11. AIR CLEANERS. Should have oil to oil level mark in bowl—no excessive accumulation of dirt in bottom. Oil may be black if used crankcase oil is used for servicing.
12. AUXILIARY GENERATOR. Check oil level, air cleaner, and operation. Should start easily.
13. MAIN ENGINE OPERATION. Master switch should be off when engine isn't running. Can be seen through driver's hatch. Check whether it starts easily and runs smoothly with all gages and instruments at proper reading. Place hand 12 inches from each exhaust pipe. A difference in rhythm means faulty engine adjustment.
14. Explain and demonstrate operation of driving light switch.
15. What usually causes the fan drive shaft to break? Ans: Shifting from Hi to Lo at high speed or gunning the engine with transmission in neutral.
16. How can transmission be cooled if it begins to overheat under heavy load with all fans operating? Ans: Place transmission in neutral and operate engine at 2400 RPM for 2 minutes.
17. Do you come to a full stop before shifting from a forward to reverse range or vice versa? Ans: Yes, to avoid transmission failure caused by excessive strain on the power train.
18. Have gunner rotate turret and elevate and depress gun.

Figure 1

vise these activities. He should know which components require servicing so that inspections can detect inadequacies, malpractices and omissions. All this information is available to commanders in authorized publications. Every vehicle in the unit should have, as part of the on-vehicle material (OVM), the pertinent technical manual and lubrication order. These publications provide the commander with complete information about that particular vehicle. From this information he can determine reliable performance standards, insure effective inspection procedures and provide the incentive for outstanding performance. An example of a suitable check list which can be extracted from the TM is shown in *Figure 1*. It is a technical reminder check list which if properly employed can be a valuable aid to all commanders.

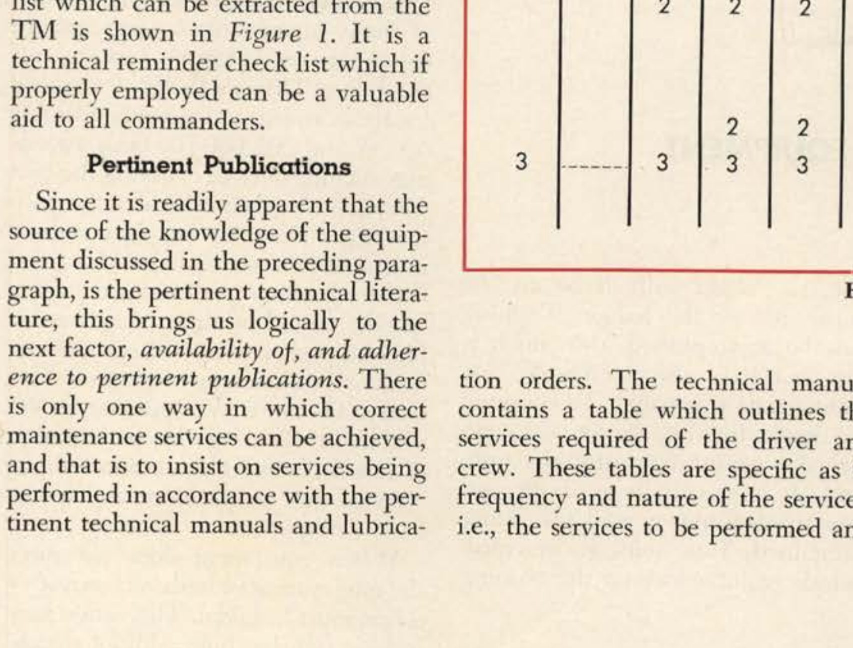
Pertinent Publications

Since it is readily apparent that the source of the knowledge of the equipment discussed in the preceding paragraph, is the pertinent technical literature, this brings us logically to the next factor, *availability of, and adherence to pertinent publications*. There is only one way in which correct maintenance services can be achieved, and that is to insist on services being performed in accordance with the pertinent technical manuals and lubrication orders. The technical manual contains a table which outlines the services required of the driver and crew. These tables are specific as to frequency and nature of the services, i.e., the services to be performed and whether they are carried out daily, weekly or bi-weekly. If these tables are followed, no required service will be omitted and each service will be performed in the prescribed manner. The manual therefore is a guide to driver and crew services. The advantages that can be gained by insisting on the presence of these publications in each vehicle and assiduous use made of them by the drivers and crews are evident. The foregoing point is stressed because experience reveals the fact that in many organizations these publications are not physically present in the vehicles. An extract of a technical manual service guide table is shown in *Figure 2*. Notice the detail and realize the effectiveness of such a guide when its use is made mandatory.

Table II. Daily "A," Weekly "B," and Biweekly "B" Preventive-Maintenance Services—Vehicle (For Services Pertaining to Armament, Refer to Table III)

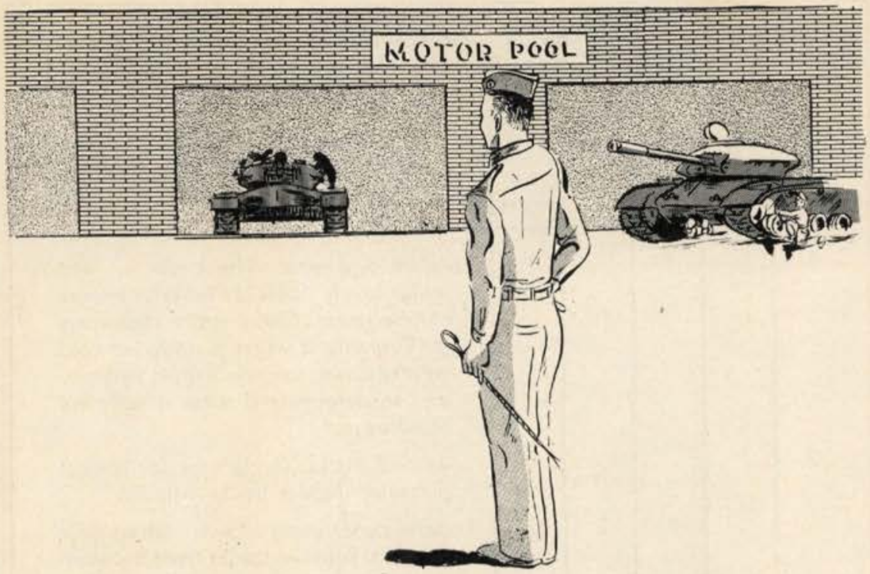
Daily "A"				Weekly "B" and biweekly "B" service	Procedure
Before operation	During operation	At halt	After operation		
1	------	1	1	1	*Fuel, oil, and water.* Check fuel, oil, and water levels. Look for leaks in engine compartment. Check spare containers for contents. If water is added in cold weather, test solution with a hydrometer to determine if there is sufficient anti-freeze.
2	------	------	------	2	*Tires and tracks.* Gage tires for correct pressure, inspect tracks visually.
		2	2	2	Remove penetrating objects such as nails or glass. Remove stones from between duals. Note any apparent loss of air, unusual wear, or missing valve caps.
			2	2	Inspect tracks for correct tension.
3	------	3	3	3	*Leaks, general.* Look under vehicle for indications of fuel, engine-oil, gear-oil, water, or brake-fluid leaks.

Figure 2


SGT.! GET THE TM OUT OF THE VEHICLE

Pride in Equipment

Pride in equipment is the most intangible of the five factors under consideration. It would be rather difficult to provide a panacea for instilling pride in equipment, because it is of inspirational nature and would depend on the individual commander. Yet every effort should be made to proclaim the virtues of armor equipment. We have the best fighting men



KNOWLEDGE OF EQUIPMENT

and equipment in the world. It is not meant that we should blindly accept all equipment without an eye to improvement. Commanders in the field often see where a piece of equipment can be improved by modification or re-engineering. This is accomplished by submitting an Unsatisfactory Equipment Report (UER), which initiates the established procedures for effecting needed modification or redesign. The users' experienced recommendations along with the skill of the developing agency should produce an outstanding end-product. A helpful means for instilling pride is to make permanent assignments where it is possible. Personnel assigned to units develop an *esprit* and feel that their organization is the best unit in the Army. Assign them to vehicles in a similar manner. Cultivate pride of ownership. They will then want their vehicle to be the best in the organization. This attitude pays off for the commander in good PM.

The Time Element

This brings us to the factor of *time*. Sufficient time should be provided to accomplish driver and crew services. *See Figure* 3. Time factors have been mentioned in previous articles; however they are of sufficient importance to bear repetition (*ARMOR*, July-August, 1955). Without sufficient time, the result will all be on the minus side of the ledger. Training must be accomplished, this much is true; but it is also irrefutable that maintenance is training. To continue this theme, training *cannot* be accomplished without operational equipment. It is as certain as death and taxes that equipment will fail if not maintained. Time *must be* provided. Include maintenance on the training schedule and insure that the time is utilized properly. Have every available man present and the activity *supervised* by all echelons of command.

BEST
DRIVER
of
MONTH

RECOGNITION

Recognition of Performance

The final factor concerns *awards to personnel*. Awards should not be presented haphazardly. Personnel should have to work for them. Announce the types of awards available; then chart the progress of each individual or group. When requirements are met, the presentation of the award should be made in a prompt orderly manner. Awards fall into two general categories: those constituted by the Department of the Army and those provided by the unit. Regarding the first of these, superior drivers may qualify for the Expert Driver's License and the Expert Driver's Badge. Provisions for these awards are contained in AR 600-55 and AR 600-70. Unit awards may include devices denoting the best wheeled or tracked vehicle in the unit. Privileges may also accompany these unit awards. Awards should be given for outstanding performance over a specific period of time. When possible, the presentation will normally be made in conjunction with a unit ceremony. The maximum publicity is desirable in effecting the presentation of awards, to include mention and pictures in unit publications and hometown newspapers.

When equipment does not meet the minimum standards set, corrective action must be taken. This action may include re-inspection, additional time for maintenance and closer supervision. Above all, the implementation of corrective action must be characterized by correct principles and techniques of leadership; it must not be permitted to degenerate into an action which is merely administrative in nature. The most effective results will be obtained by the more positive approach of recognizing outstanding performances.

The proper application of these five factors, by the commanders will definitely attain the desired results. If the commander makes known what he expects and the standards to be met, provides sufficient time to accomplish these maintenance activities, and is genuinely concerned, he will point the way to an effective maintenance program and insure availability of the traditional firepower, mobility and shock action of Armor.

AVERAGE TIME CHART

(EXTRACTED FROM a U.S. army armor School ~~class~~ instruction material AC4.10602)

SERVICE OR REPAIR	TRACKED VEHICLES	WHEELED VEHICLES
Before-operation service	30 minutes (Crew)	15 minutes (Driver)
At-halt service	15 minutes (Crew)	5 minutes (Driver)
After-operation service	1 hour (Crew)	20 minutes (Driver)
B-service	4 hours (Crew)	1 hour (Driver)
C-service	1 day (1 Mech and 2 crewmen)	1 day (1 Mech and driver)
D^1 service	1 to 1½ days (1 Mech and 2 crewmen)	1 to 2 days (1 Mech and driver)
D^2 service	2 days (1 Mech and 2 crewmen)	1 to 2 days (1 Mech and driver)
Remove and replace top armor and power package	4 hours (1 Mech and 2 crewmen)	
Remove and replace engine Assy ½-ton truck		3 hours (2 Mech)
Remove and replace final drive and sprocket Assy	6 hours (1 Mech and 2 crewmen)	
Remove and replace shock absorbers	1 hour (Crew)	30 minutes (1 Mech)
Remove and replace torsion bar	2 hours (Crew)	
Remove and replace road wheel	1 hour (Crew)	
Remove and replace wheel		15 minutes (Driver)
Remove and replace one track	6 hours (Crew)	
Track adjustment one side	30 minutes (Crew)	
Complete refueling from 5-gal cans	1 hour (Crew)	5-10 minutes (Driver)

Figure 3

Armor and the Army

The Association of the United States Army will hold its second annual meeting at the Sheraton-Park Hotel in Washington, D. C., during the period of 25, 26 and 27 October. This meeting will be significant and it is believed that all members of the United States Armor Association should take a long look at it and the forthcoming results from the deliberations. Since its first annual meeting, the Executive Council has been at work determining how it best can serve the needs of the Army in educating the American public on the vital role of United States Army and the soldier. Succeeding issues of *ARMY,* its magazine, have reported the progress which is being made by the Executive Council. The intent is to transfer the responsibilities of its present Executive Council, composed mostly of active duty personnel, to a new governing body composed of representatives from Industry and Commerce, Education, the Professions, Government, Military Associations, Civic Leaders, Retired Army Personnel, Past Secretaries of the Army and Past Presidents of its present Association. This change will be effected at the forthcoming annual meeting.

In transferring the Association's responsibilities to a new governing body, composed of top-level people, not on active duty, it is believed that the broader aims and purposes of the Army Association can be carried out more effectively. To all intents and purposes, the Association of the United States Army will be able to fill a void which we all recognize: To have an over-all organization capable of presenting to the American public the story of our Army, in which we all so proudly serve.

In keeping with their aims and purposes, it is well to reiterate that we should take a long look at the Fall meeting.

editorial

It is believed that we, as individuals interested in the well-being of our Army, should pledge our support and close cooperation, both individually and collectively, to the endeavors of the Army Association. To support these beliefs, it might be well to take a second reading of our editorial which appeared in the March-April 1956 issue of *ARMOR,* where we reiterated our position as it was originally stated in the Spring of 1953 regarding the formation of an over-all, Army-wide organization to present the Army in the proper perspective to the American people.

In pledging our support and cooperation with this new look of the Army Association, we do so with the sincere belief that we have strengthened our Army. At the same time, recognizing the need for a separate Armor Association as it is presently constituted, we do *not* relinquish our own Association and its journal *ARMOR.* There is a continuing need for the United States Armor Association and its magazine *ARMOR* to assist the professional in the mobile field. It is also believed that to best get this professional story to its members the staff must be composed of active duty personnel who are aware of the day-to-day problems. The same requirements exist for many of the other technical journal counterparts, such as *The Infantry School Quarterly, The Military Review* and many others which are just as important to the Nation's security.

We do believe that there is a need for a united voice to tell the Army's story to the American public, and we realize that this can be more effectively accomplished by men not in uniform. It is hoped that other organizations similarly interested in the well-being of the Army will likewise pledge their full support of the Association of the U. S. Army.

CARDED

INCREASING OUR REGULAR ARMY OFFICER CORPS

By COLONEL WILLIAM P. JONES, JR.

PUBLIC Law 737 of the 84th Congress, the "Armed Forces Regular Officer Augmentation Act of 1956," is of interest to Reserve or National Guard officers, former Army officers and civilians who may desire Regular Army commissions, as well as to officers now on the active Regular list of the Army. It is the first comprehensive Regular officer procurement legislation since the Officer Personnel Act of 1947 and provides, for the first time since 1946-47, general authority for appointment of Regular Army officers above the permanent grade of first lieutenant.

Its enactment is another indication of the desire of the Executive and Legislative branches of the government to provide incentive and opportunity for military careers in the Armed Services and to reduce turnover in the officer corps. It is noteworthy that, after thorough consideration in the Armed Services Committees of the House and Senate and considerable revision by the House Committee, it was passed by Congress without even one dissenting vote.

The purpose of this article is to describe the important provisions of the Act which apply to the Army, the policies to be followed in implementing it and the implementation plan.

FIRST, the Army's statutory Regular male and WAC commissioned officer authorization has been increased from 30,600 to 49,500. This ceiling does not include the Army Nurse Corps, Army Medical Specialist Corps or the professors at West Point and no provision of the Act applies to them. Furthermore, the only feature of the Act which affects medical and dental officers is the total increase in authorization.

The present Regular officer strength chargeable against this authorization is about 27,000. The following goals have been approved by the Secretary of Defense and the President for procurement action:

1. 72% of statutory authorization, or 35,640, by July 1958.
2. 80% of authorization, or 39,600, by 1963.

COLONEL WILLIAM P. JONES, JR., Corps of Engineers, received his BS and MS degrees from the University of Illinois. He received his Regular Army Commission in 1937. During World War II he served in Europe as a Combat Engineer Battalion Commander and Engineer staff officer at Fifth Army and later Fifteenth Army Group. In 1945 he commanded an Engineer Combat Group and took them to Korea. Returning Stateside he served in the Office of the Chief of Engineers. He next was the Engineer on the Joint U. S. Brazil Commission in Brazil. He returned to the States in 1954 to his present position in the Office of the Deputy Chief of Staff for Personnel.

These objectives are based upon estimates of the rate at which well-qualified officers can be selected and appointed while at the same time a balanced officer structure, without the pronounced "humps" which have caused so much difficulty in the past, is created and maintained.

The President has decided to withhold approval of procurement beyond the 1963 goal of 39,600 until the Army's Regular officer strength approaches that figure. Therefore, Army planning has been based principally upon this manning level.

Second, appointments in the Regular officer corps may be made without restriction as to permanent grade. The Army plans to appoint only in grades below general officer. As a matter of fact, at present no officer could qualify for original appointment above the permanent grade of colonel under provisions of the Act.

Third, any officer appointed under this Act must be of such age as to permit him to complete 20 years of active commissioned service before reaching his 55th birthday. This may include periods of service both before as well as after appointment.

Fourth, except for Veterinaries, Chaplains, JAG's and MSC's (for whom provisions of previous laws and policy continue to apply), the maximum age for appointment with no promotion list credit is 27. This "base" age of twenty-seven may be increased by the amount of promotion list service credited at appointment.

Fifth, for purposes of determining grade, promotion list position, seniority in permanent grade, and permanent promotion eligibility, an appointee may, *in the discretion of the Secretary of the Army*, be credited with his active commissioned Army service after 6 December 1951 and since his 21st birthday, plus not more than one of three types of constructive credit.

If an appointee receives constructive credit under any of the three provisions, his total credit may not exceed the amount by which his age exceeds 27. This requirement may not be readily apparent to readers of the Act itself, but it represents the intent of Congress as manifested in the hearings. Since the maximum age at appointment of 27 may only be increased by the amount of credit granted, it is obvious that if an appointee receives constructive credit his total credit must exactly equal his age minus 27.

The first constructive credit provision allows a commissioned officer on active duty on the effective date of the Act to receive credit for a period, not to exceed eight years, equal to the amount by which his *commissioned* service creditable for basic pay exceeds his active commissioned service.

Example:

An applicant, 40 years old at appointment, was on active duty on 20 July 1956, the effective date of the Act. He has ten years of active commissioned service and five years additional service as a Reserve officer not on active duty. He could be credited with ten plus five or 15 years, were it not for the fact that this exceeds his age minus 27; since this is the case, he will be credited only with 40 minus 27, or 13 years.

The second constructive credit provision permits granting of up to eight years such credit to not more than 200 outstanding specialists in critical fields in accordance with criteria prescribed by the Secretary of the Army and approved by the President. Such specialists must be appointed within two years after the effective date of this Act. Their names, grades and justification for their appointment must be submitted to the House and Senate Armed Services Committees by 15 July 1958.

It is the intent of Congress that this provision provide the Army a means to obtain such highly qualified individuals as nuclear physicists, electronics experts and similar scientific personnel. The criteria for their eligibility and method of selection will be announced by the Department of the Army in a special circular.

The third constructive credit provision allows not more than two years of such credit to be given to appointees who do not qualify under either of the other provisions.

Example 1:

An applicant, 40 years old at appointment, has 12 years of active commissioned service. He could be credited with 12 plus two, or 14 years, were it not for the fact that this exceeds his age minus 27; as it is, he will receive credit only for 40 minus 27, or 13 years.

Example 2:

An applicant, 40 years old at appointment, has ten years of active commissioned service. He could be credited with ten plus two, or 12 years, but his age at appointment may not exceed 27 plus his promotion list credit, or 39 years. Therefore, he is *ineligible*.

In the promotion lists published in the Army Register, a "basic date" is shown for each Regular Officer. Subtraction of this date from the current date gives the officer's service credit for promotion purposes at any given time.

The effect of the Act's constructive credit provisions on basic dates of new appointees may be summarized as follows:

1. The basic date of an officer who receives credit only for active commissioned service must fall between his 21st and 27th birthday.
2. The basic date of an officer who receives any constructive credit must be his 27th birthday.

The first step toward augmenting the Regular officer strength consists in increasing the normal annual procurement of junior officers. This increased procurement has already been initiated. It involves expansion of the procurement of Regular lieutenants from among Distinguished Military Graduates of ROTC institutions and junior officers on active duty.

The remainder of this article pertains to the initial augmentation which is necessary, in addition to the increased normal annual procurement in order to achieve the approved goal of 35,640 by July 1958. *Figure 1* illustrates the Army's plan for this augmentation. The horizontal scale indicates years of *completed* promotion list service. The vertical scale shows the number of officers in each year group.

Two "optimum distribution lines" are shown, one for the statutory authorization of 49,500 and the other for the Presidential manning level of 39,600. The Army's plan is based upon the optimum distribution of the latter figure.

Such an optimum line, which takes into account normal and promotional attrition as well as other factors, represents the distribution which would result if a constant annual input were maintained at the bottom (left) of the structure, and only at the bottom, for 30 years or more. The upward break at three years' service results from the three years professional credit which medical and some other professional personnel receive at time of appointment.

IN the lower part of *Figure 1* is shown the distribution of the projected Regular officer strength in July 1958, *prior to any appointments in the initial augmentation*. The "hump" in the 16 year group (basic date in FY 1942) and the "valley" in the 11th year (basic date in FY 1947) are especially worthy of note.

The chief source to fill the vacancies below the 39,600 optimum line consists of reserve component officers on active duty. Although others will be eligible, the number who will be interested and qualified cannot be estimated accurately.

Figure 1 also shows the estimated distribution of the approximately 40,000 eligible officers of reserve components who will be on active duty in July 1958. Each officer is placed in a year group in accordance with the maximum service credit which he could receive if appointed.

The estimated 40,000 eligibles do not include the "obligated officers" (principally ROTC and OCS graduates and drafted medical and dental officers), also shown in *Figure 1*. These officers are eligible for Regular appointment under the Army's normal procurement programs, and most of them who will be in the Active Army in July 1958 will have entered active duty too late to apply for this augmentation.

It is estimated that in any one year group 50% of the eligible officers will be both interested and qualified. If this is accurate, officers will be available to fill the structure to the 39,600 optimum line except in the 11 year group and above 21 years service.

The largest number of reserve officers is available in the 16 year group, where the present Regular hump exists. Outstanding officers who qualify for this and several lower year groups *on the basis of active commissioned*

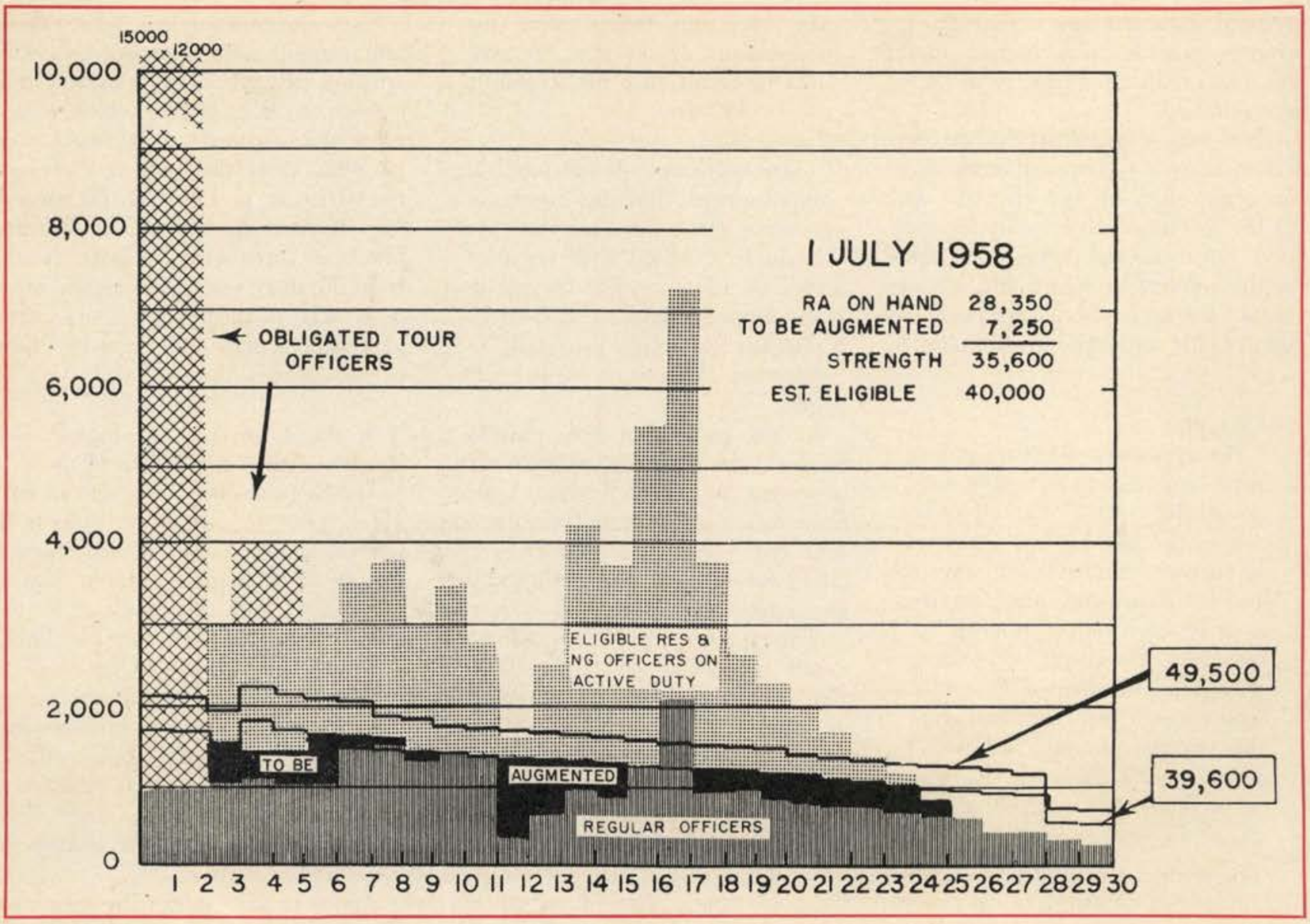


Figure 1.

service will be offered appointments with up to two years less service credit than the maximum allowed by the Act. This will increase selectivity in these lesser years and allow filling of the 11th year understrength. This procedure is not necessarily a disadvantage to those concerned, since they will be permitted to remain on active duty that much longer.

The solid block area in *Figure 1* indicates where it is planned to appoint approximately 7,000 officers by July 1958. To the left of the hump most appointees will be credited only with active commissioned service; to the right of it most will receive some constructive credit.

Each appointee will be placed on the promotion list after, and be given the same permanent grade as, the most junior officer already on the list who has the same or greater service credit and who has not been passed over for permanent promotion. If he is on active duty when appointed, his temporary grade will not be changed; if he enters the Regular Army from non-active duty status, his temporary grade and date of rank will be determined in the same manner as if he were being called to active duty as a reserve officer.

In accordance with a commitment made to Congress during the hearings, any applicant who applied for a Regular Army appointment under a previous program or competed in a competitive tour will, if selected under this program, be given a grade and date of rank junior to that of any Regular Army officer who competed with him successfully in the same program or tour in which he failed of selection. Furthermore, with the exception of the 200 highly qualified technical specialists previously mentioned, no officer will be appointed in a permanent grade higher than the highest in which he has served satisfactorily on active duty. These restrictions, together with the increased ceiling, will safeguard adequately the interest of the Regular officers already in the Army.

Among the concepts on which the selection plan is based are the following:

1. Selection will be centralized; administrative processing will be decentralized.
2. Selection will be made by boards of mature officers working under the supervision of the Chief, Career Management Division, TAGO. The data available to them will consist chiefly of the candidates' 201 files; however, for applicants not on active duty and those who have limited service additional selection aids, such as scores on biographical information blanks and interview board reports, will be furnished to selection boards.
3. All appointees must be found to be fully qualified to be Regular officers; from among those fully qualified the best-qualified will be selected to meet the Army's requirements. Quality will not be sacrificed to meet strength goals.
4. The man must seek the job rather than vice versa; there-

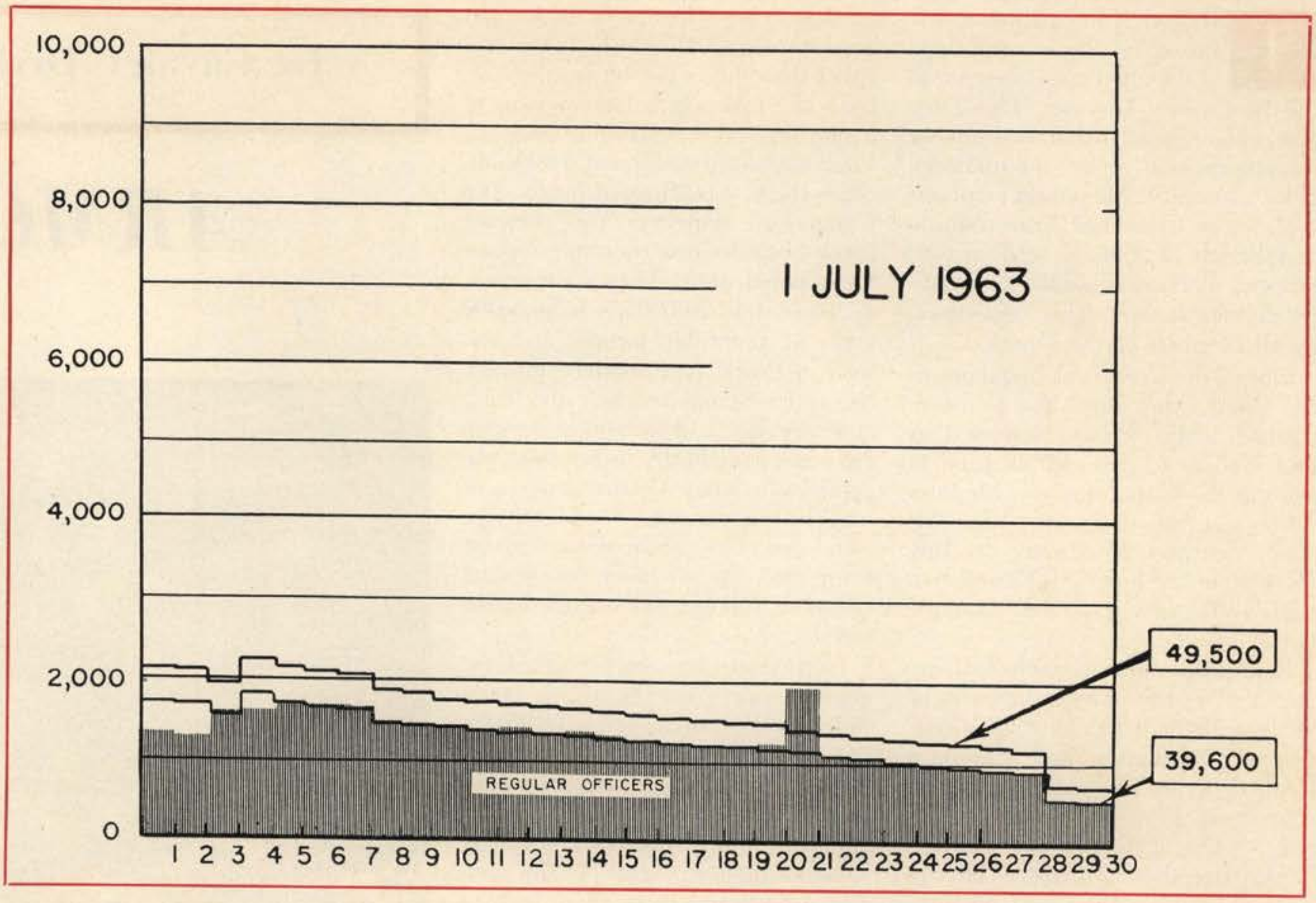


Figure 2.

fore, initiative is with the individual and candidates must submit applications.

The time schedule is approximate and flexible, but it represents the best current estimate. It will be noted that wherever possible various steps overlap to conserve time.

1 October 1956 to 31 January 1957 is expected to be the period during which all applications must be submitted. A standard application form will be used and certain prescribed documents must be submitted.

From November 1956 through March 1957, applications will be processed by major commands. They will be checked for completeness and those from ineligible applicants will be rejected. In appropriate cases, required educational tests will be administered and interviews by boards of officers will be conducted by major commands.

December 1956 through April 1957 is the period for processing by The Adjutant General. This will include assembly and checking of files and various other administrative actions.

Selection boards will act from January through October 1957. In sequence, first, one group of boards will determine which applicants are fully qualified, and then another group will make the final selection of those best qualified from the fully qualified lists in accordance with the Department of the Army's requirements.

The period November 1957 through May 1958 is reserved for such background investigations and physical examinations of those officers selected as may be necessary, preparation of nomination lists, approval by the Secretary of the Army, Secretary of Defense, the President and the Senate, consummation of appointments and issuance of orders.

Allowing for unforeseen contingencies, it is probable that most appointments in the initial augmentation will be made in June or July 1958. A limited number of selections may be announced earlier than this and probably in the summer of 1957.

A Department of the Army circular which will furnish detailed information required by applicants as well as by commanders and staffs below major command level is being published. It will be given the widest distribution, and a variety of means will be used to insure that all prospective candidates, both in service and in civil life, have opportunity to apply.

Finally, let us look briefly at the effect of this augmentation upon the Army's future Regular officer structure. *Figure* 2 shows the structure projected to 1963, after the second objective of 39,600 has been achieved. The hump has been partially absorbed by the increased ceiling and reduced by attrition; the void at the bottom (left) compensates for it and allows continuation of annual procurement from junior officers on active duty.

If at some time in the future the President permits procurement towards the statutory authorization of 49,500, this strength will be approached gradually, principally by increasing normal procurement of junior officers. Whether the process can be accelerated by selective appointment in higher grades will depend upon availability of experienced reserve component officers at the time.

CARDED

1st Cavalry Division

ARMOR

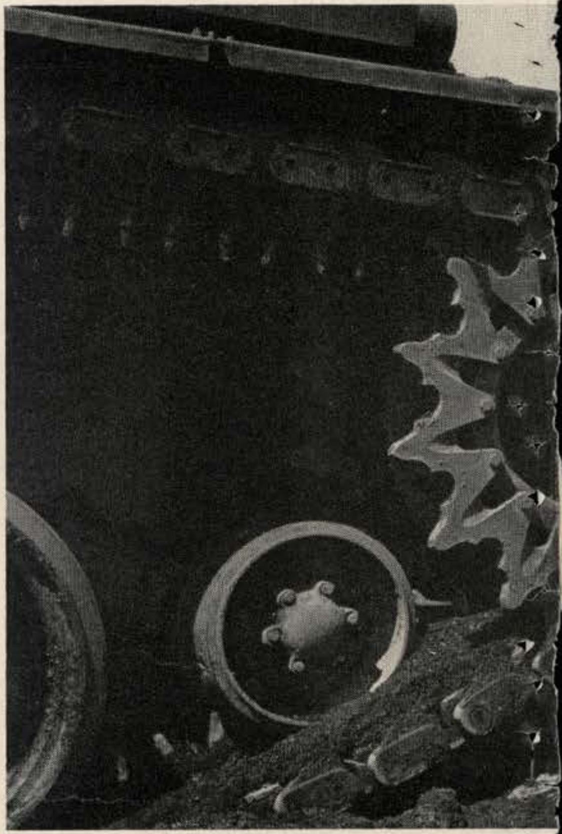
THE 70th Tank Battalion, stationed on the eastern slope of Mount Fuji, is organic to the 1st Cavalry Division. This Division, although organized as a normal infantry division, retains the traditional Cavalry spirit. Maximum emphasis is placed on Combined Arms training and the role of armor in modern warfare and its mission within the infantry division is thoroughly understood by all members of the Division.

One of the oldest tank battalions in the Army, the 70th has a distinguished battle record. Activated at Fort George G. Meade on June 6, 1940 as the 67th Infantry (Medium Tanks), it was designated the 70th Tank Battalion (Medium) on July 15, 1940 as the first GHQ Tank Battalion of the newly formed "Armored Force."

Battle participation included: invasion of North Africa, invasion of Sicily and Sicilian Campaign, invasion of Normandy and European Campaign, and action in Korea from August 7, 1950 to November 10, 1951. A few of the many decorations of the Battalion include: Distinguished Unit Streamer for Contentin Peninsula, Belgian Fourragère and Republic of Korea Presidential Unit Streamer.

After its participation in the Korean conflict, the 70th Tank Battalion spent three years on the Japanese island of Hokkaido before moving to Camp Fuji on the island of Honshu. From a training standpoint, Hokkaido offers the best facilities in Japan. The Camp Fuji maneuver area presents many obstacles to a training program for armored units. The area is small, approximately 14,000 yards by 5,000 yards of trafficable terrain, and the road network is extremely limited. Safety limitations preclude the firing of 90mm shot, and portions of the area are open periodically to Japanese pilgrims who visit Mount Fuji and neighboring shrines. The most serious deficiencies are the restrictions on firing and the inability to conduct adequate training on mounted road marches.

In spite of obstacles presented, armored training can be and is being successfully conducted in Japan. Commanders have been successful in devising ways and means to fit armored training and tactics to the terrain and local conditions. Maintenance of high standards of tank gunnery proficiency is accomplished by additional firing of sub-caliber ammunition and the use of 90mm HE as a substitute for 90mm shot where practicable. While this does not allow qualification of gunners as prescribed by regulations, it has resulted in consistently high scores being attained by tank crews on the tank crew proficiency tests.



In war teamwork leads to victory with less loss of

The problem presented by the restricted road net has been partially overcome by placing maximum emphasis on training platoon and company-sized units in the technique of road marching. Unit commanders are well aware that many of the road net restrictions presently imposed by the Administrative Agreement would be lifted in case of any emergency. Accordingly, every armored unit commander is required to make continuous detailed road reconnaissance to points of probable armor employment.

U. S. Army

Field maintenance by the Maintenance Platoon, 70th Tank Battalion, Camp Fuji.

JAPAN

IN THE FAR EAST

By MAJOR ALFRED G. HILL

U. S. Army

men and equipment. Armor-Infantry teamwork is stressed in training at every opportunity.

The location of the Division units does not permit the formation of Combined Arms teams as often as is desirable; however, the concentration of infantry-armor-artillery-air in the Fuji Area during the periods for testing infantry battalions, regimental combat teams and the ATT's of all Division tank units provides an opportunity for the 70th Tank Battalion to concentrate on Combined Arms training during these periods.

The Fuji training area is used jointly by Army, Marine and Japan Ground Self-Defense Force units. This concentration of troops necessitates detailed prior planning for establishing priorities on use of range and maneuver areas and provides valuable experience to the battalion staff in all of the joint planning operations.

The normal missions of the 70th Tank Battalion are:

1. Maintain an effective striking force for combat operations.
2. Train armor leaders and specialists.
3. Provide planning assistance to and staff supervision of the regimental tank companies and the division reconnaissance company.
4. Provide assistance to Military Assistance Advisory Group, Japan and to Ground Self-Defense Forces, Japan.
5. Assist in the provision of area administrative support.

The accomplishment of these missions is made difficult by the high rotation rate, shortage of officers and understrength companies. In spite of these obstacles, the satisfaction derived from accomplishment of assigned missions and the success obtained by using noncommissioned officers in officer positions has resulted in a high *esprit* and excellent individual morale.

The combat readiness of the Battalion was demonstrated in February 1956 during the conduct of the Battalion AAT. Normal infantry-artillery-engineer attachment was made and tactical air support was furnished by the 5th Air Force. The Aggressor Force was composed of a Marine Corps tank company reinforced by infantry, engineers and Marine tactical air. The test was executed under most adverse weather conditions. Snow, sleet, hail, high winds and rain made the exercise a test of stamina and field expedient proficiency as well as one of tactical competence. The resultant rating of 91.7 per cent was indicative of the individual and unit capabilities for accomplishing the Battalion's primary mission.

The feasibility of maintaining a tank battalion in Japan has long been a topic of considerable debate, but in every discussion of the pros and cons one fact is not argued: in the defense of the Japanese Home Islands, the employment of the infantry division's organic tank battalion in its normal and vital role is essential to the attainment of the infantry division's maximum combat capability either in the defensive or offensive application. It is true that terrain, bridges, tunnels and large rice paddy areas present serious obstacles to the mobility of armor, but there are no restrictions on water movements which provide excellent long range mobility for getting the Battalion to any battle area. Once in the battle area the adverse factors will not deny to the Division Commander the mobility, firepower and shock action of his armor striking force.

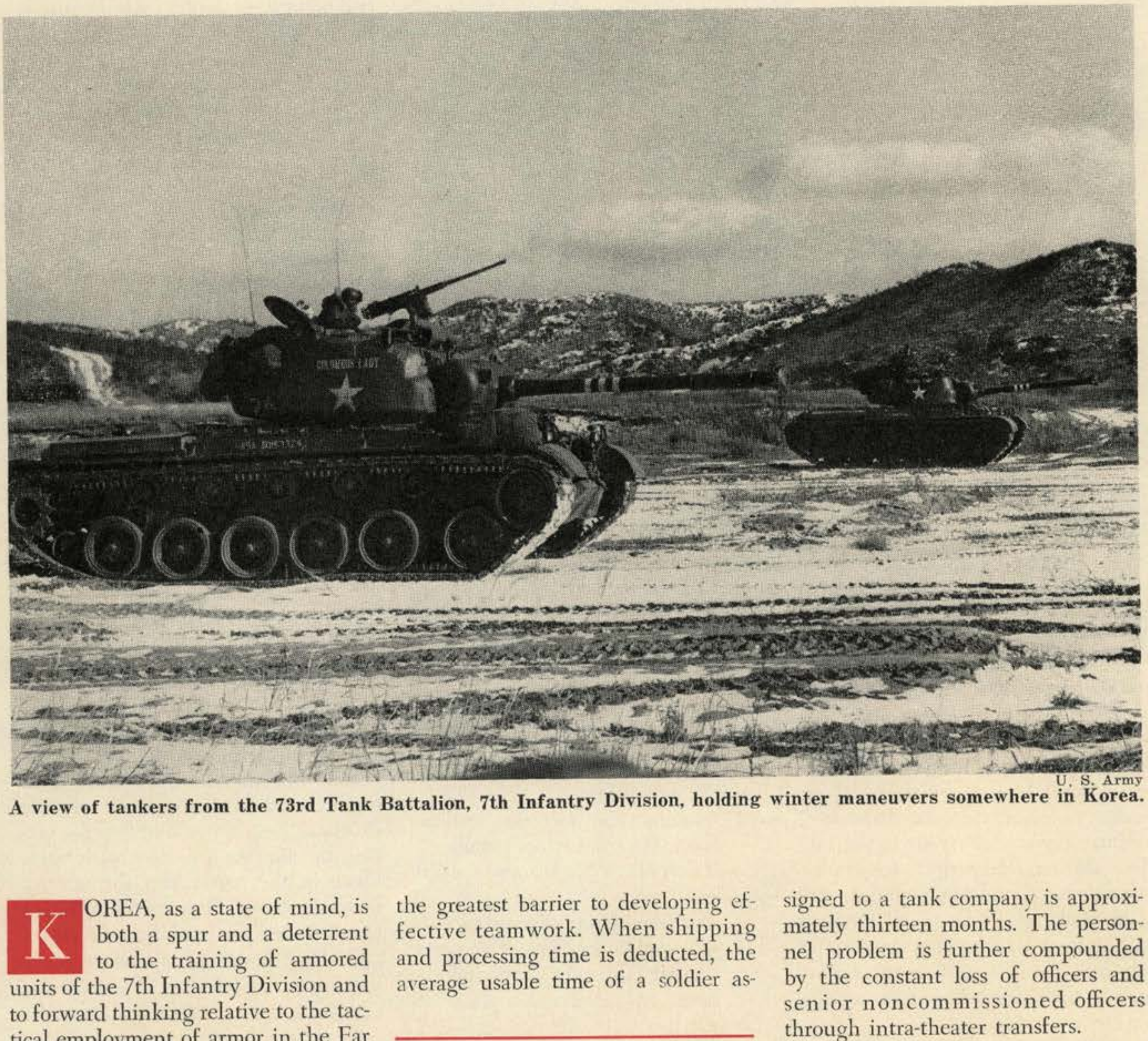
MAJOR ALFRED G. HILL, Armor, received his commission in 1942 from OCS. During World War II he served in the Pacific Theater with the 79th Amphibious Tractor Company. Subsequent to the War he served in the States, then in the Caribbean with the 45th Reconnaissance Squadron. He attended the Advance Course at The Armor School and remained there as an instructor. He was next assigned to the 70th Tank Battalion where he is Battalion Executive Officer.

CARDED

7th Infantry Division

KOREA

ARMOR IN THE FAR EAST



U. S. Army

A view of tankers from the 73rd Tank Battalion, 7th Infantry Division, holding winter maneuvers somewhere in Korea.

KOREA, as a state of mind, is both a spur and a deterrent to the training of armored units of the 7th Infantry Division and to forward thinking relative to the tactical employment of armor in the Far East theater.

In Korea, the rapid turnover of personnel is a major training problem. Teamwork, of course, is the key to successful operations, whether it be a single tank, a tank company or a division tank battalion. The limited 16-month tour of service in Korea is the greatest barrier to developing effective teamwork. When shipping and processing time is deducted, the average usable time of a soldier assigned to a tank company is approximately thirteen months. The personnel problem is further compounded by the constant loss of officers and senior noncommissioned officers through intra-theater transfers.

This article was prepared jointly by Major General Paul W. Caraway, J3 United Nations and Far East Command (formerly, CG, 7th Infantry Division), Colonel Hal C. Pattison, Armor, Assistant Division Commander, 7th Infantry Division and Lt. Colonel Man E. Harris, Armor, CO, 73d Tank Battalion, 7th Infantry Division.

The resultant disruption to the integrity of tank crews has been alleviated by careful planning and continuous personal supervision. Replacements, trained to operate M47 and M48 tanks, must be retrained to operate the M46 tanks used in Korea. Consequently, the armor training cycle in Korea never has an identifiable beginning or ending.

The problems arising from the lack of facilities, modern armor vehicles and inordinate maintenance requirements, are largely attributable to the limitations imposed by the Armistice Agreement. The Armistice Agreement raised hopes that there would be an early political settlement and a subsequent withdrawal of military forces from Korea. As a result, until August 1955 all United States Army forces mentally had one foot in the stirrup ready to mount and gallop away. The tank units continued to use field expedients to maintain their vehicles. Further, the Armistice Agreement required that tank units be equipped with the M46 vehicle, the tank in their possession at the time the Agreement was signed. As a result, the regimental and divisional tank units have been forced to operate over-age and combat-weary tanks. Constant attention to maintenance, and a continuous program of rebuilding tanks has alleviated, but cannot eliminate, the maintenance problem. An aggressive program to improve maintenance facilities and the training of tank mechanics is currently underway.

The Army Training Program, augmented by mobility and field exercises, has provided a completely adequate training vehicle for armored units of the 7th Infantry Division. Range facilities for the armored units are not elaborate, and in the past have been considered inadequate. However, the ground forms in the 7th Division's area provide almost limitless areas for improvised ranges. While large tracts of trafficable land are not available for training tank companies, the usable areas are adequate. Since daily training is conducted on ground similar to that on which these units may be required to fight, the training in Korea more closely parallels combat requirements than that conducted by our armored units elsewhere in the world.

The armored officer or soldier who has previously served in the United States and Europe, or who has just left school, is likely to be initially baffled by the Korean terrain. The rugged mountain country, the bad roads and the variables in climate constitute a challenge which requires vision and flexibility of mind to insure understanding that this type terrain dictates no change, but does require adaptation of the basic principles of employment of armor to existing ground. As a matter of hard, practical fact, the commanders of this Division's tank companies must adapt the basic principles of the use of armor to the terrain; and if they wish to theorize, the theory is subject to immediate test by the ground.

Combat team field exercises have shown that Korea imposes no unusual or unorthodox variations in current armored tactical doctrine. The exercises also have proved that natural obstacles of terrain and weather can be overcome. In Korea, conditions do exist which preclude the mass employment of armor. However, in even the most unpromising areas, careful ground reconnaissance has demonstrated that tanks can always be positioned to support the attack or the defense. In Korea, experience has emphasized the original role of the tank as an automatic weapons suppressor on the battlefield. Tank units must be firmly and centrally held, and not parceled out by attachment to regiments or battalions. Tactical exercises have proved that the Division can rely upon the inherent mobility and firepower of its tank units.

A soldier ordered to Korea should not feel that he has received an unlucky break, or that the problems in Korea are different from problems elsewhere. The problems inherent in maintaining and using armor in Korea are not markedly different from the problems faced by US tank units in other areas of the world. The development of adequate maintenance facilities within Korea, as elsewhere, is dependent upon time, money and command interest. The difficult personnel situation is balanced to a degree by the fact that in Korea a man can soldier twenty-four hours a day, three hundred and sixty-five days a year.

Service in a tank unit in Korea offers the armored officer, noncommissioned officer or enlisted man a challenge and an unparalleled opportunity to develop the professional military competence essential to maintaining armor of the United States Army as the standard for the world—as THE ARM OF DECISION.

U. S. Army

Mechanics working on an M46 tank to keep it on the move.

U. S. Army

A tank sits in defilade during a field training problem.

CARDED

24th Infantry Division

KOREA

ARMOR IN THE FAR EAST

By BRIGADIER GENERAL LORIS R. COCHRAN

U. S. Army
A tank of the 24th Division attacking along a stream bed.

U. S. Army
A crew awaiting inspection of their full tank tool layout.

IN any consideration of the role of "Armor in the Far East," armored elements of the 24th Infantry Division in Korea occupy a unique position. By virtue of the mission and physical location of the 24th Infantry Division, its 6th Tank Battalion, its 24th Reconnaissance Company, and its three regimental tank companies are committed to operational, training and housekeeping requirements which seldom fall to the lot of a tanker.

The 24th Division is the sole U.S. Division in the Far East which today is stationed face to face with Communist military forces. Positioned in the rugged, never-ending hills of west central Korea, the 24th stands on twenty-four hour alert along the southern boundary of the Demilitarized Zone. Four thousand meters separate Communist and U. S. Forces. An uneasy armistice requires constant patrolling and observation of the Demilitarized Zone and areas north.

Armored units are integrated into defensive plans and must maintain a capability of immediate occupation of possible battle positions. The glamorous aspect of wide envelopments and fast moving sweeps is virtually denied to the American tanker in Korea.

To the armored soldier who has seen Korea, the inadequacy of roads, both in number and seasonal dependability, plus steep slopes of successive hill and mountain ranges separated invariably by rice paddies which are negotiable by armor only when frozen, presents an enigma.

Initial battle positions of regimental tank companies in some instances place those units in static positions overlooking the front. Mobility is limited and the firepower of the tank would be its principal pay-off in the early phases of hostilities.

These restricting conditions which pose problems for the operational mission of armor of the 24th Division have a similar effect on training. In addition to natural limitations of terrain and weather, armor training is further handicapped by the economic necessity of respecting and avoiding cultivated areas; almost any place where man can walk is considered tillable. Training areas are extremely scarce and becoming more so as homesteaders continue to return to areas vacated during the war. Tank ranges of Stateside standards are nonexistent and only one unimproved, substandard range is available for the firing of M46 tank guns.

The foregoing should not be construed as an indication that training is slighted or ineffective. To the contrary, by virtue of the obstacles named and others not mentioned, training receives added emphasis at all levels and is vigorously and relent-

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BRIGADIER GENERAL LORIS R. COCHRAN graduated from USMA in 1932 and was commissioned in the Infantry. During World War II he served with the 1st Armored Division in Europe. Subsequent to the War he was assigned to the Department of the Army. He attended C&GSC, AFSC and the Army War College. He was next assigned to the ARTC, Fort Knox prior to his present assignment as the Assistant Division Commander, 24th Infantry Division stationed in Korea.

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lessly carried out the year around to include platoon, company and battalion tests. Modifications and adjustment of ATPs are necessary to meet local conditions, but results are good. The Tank-Infantry-Artillery team training is exploited in frequent tactical exercises involving armored units of platoon and company size. The composition of task forces invariably includes armored elements up to and including the tank battalion.

A rare opportunity exists in Korea for training with other United Nations military forces. During the past year, armor of the 24th Division has participated in combined exercises, has conducted demonstrations, and has assisted in the training of elements of the 1st Commonwealth Division, the Turkish Armed Forces Command, as well as the Republic of Korea Army.

Inevitably any discussion of armor turns to equipment and its maintenance. By the terms of the Armistice Agreement, the introduction into Korea of new combat equipment by type and model is forbidden. As a result, armored equipment now in operation is the same by type as that available at the ending of hostilities in 1953. All medium tanks are of the M46 class; other armored vehicles, weapons and matériel are of the same vintage. A limited supply of spare parts adds to the difficulty of maintaining satisfactory old-type vehicles, most of which are well beaten and bruised by long usage in wearing terrain. It must be said, however, that an energetic program of rebuilding M46 tanks in Japan plus command emphasis on supply of parts has improved the operational capability of Korean armored units in recent months.

Tank parks are often deep in mud or dust and hard stands are a luxury seldom enjoyed. It is only by constant, concentrated, ditch-digging efforts on the part of tank crews, mechanics, maintenance officers and commanders that tank parks and maintenance are maintained at a satisfactory level.

Inextricably combined with the requirements that armored units be able to move to battle positions in a matter of minutes, and that they maintain a high standard of training and combat readiness of personnel and equipment, the armored units of the 24th Division have an additional requirement of constantly improving and maintaining physical existence.

Housekeeping chores are of major proportion. Besides building and maintaining his facilities, the American soldier must transport all his water, rations, POL for his tanks and ammunition for his guns. The drain on personnel for overhead activities is heavy as there is no personnel augmentation above TO&E to perform the many housekeeping tasks which are not normally expected of a combat unit. All units, while maintaining a status of combat readiness under field conditions, must carry out this quasi post, camp and station managerial function.

U. S. Army

Allied teamwork—a tank of the 24th U. S. Inf. Div. and Australian troops.

What of the people upon whom these responsibilities rest? All armored units of the 24th Division are at 100 per cent TO&E strength in officer and enlisted personnel. The majority are Armor School trained, and across the board the caliber of armored personnel is high. The packet platoon system has proved eminently successful. While packets received by the 6th Tank Battalion have not been maintained as platoons due to lack of noncommissioned officers within the packet and the vagaries of rotation, the integrity of individual tank crews of the packets has been held. These crews are the backbone of the armored units.

On the 21st of April, the 24th Infantry Division celebrated Armor Day. The program included a mounted review participated in by all armored elements of the Division. Tank driving and crew proficiency competitions were also conducted.

The celebration was planned by the 24th Infantry Division Armor Committee. This committee was established with the primary objective of developing and maintaining the highest standards of combat proficiency among armor units of the division. The committee has included in its efforts a program to familiarize personnel of all units with the characteristics, capabilities and limitations of armor through a series of tactical demonstrations.

The Armor Committee program has successfully enhanced the prestige and morale of armor units by prescribing distinctive insignia for personnel and markings for vehicles. Today, the yellow scarf and armored patch are conspicuous, *esprit* and morale of the armored soldier is high, and armor of the 24th Division stands ready to accomplish any assigned mission.

CARDED

25th Infantry Division HAWAII

ARMOR IN THE PACIFIC

By LIEUTENANT COLONEL RAYMOND P. CAMPBELL

THE problem of training a hundred-mile-a-day tank battalion on a 45-mile island confronted the tankers of the 25th Infantry (Tropic Lightning) Division on the unit's return from Korea in November 1954. This problem was aggravated by having a personnel turnover of about eighty percent between Korea and the start of training. In the main, it was a green unit that started advance individual training at Schofield Barracks on the Island of Oahu in January 1955.

Our solution to the problem in the 89th Tank Battalion took some time to work out but will be of interest to tankers who face toward the Orient and anticipate restricted or specialized action in jungles, over beaches or in rice-paddy country. In simplest terms it amounted to emphasizing small unit operations such as single tank proficiency problems and platoon operations. We approached road marches, firing problems, resupply and all the multitudinous aspects of training on the platoon level. Faced with extremely limited terrain, we combined in our

LIEUTENANT COLONEL RAYMOND P. CAMPBELL, Armor, graduated from USMA in 1941. During World War II he served in Europe with the 45th Tank Battalion. Subsequent to the War he attended the Naval War College and C&GSC. He received his Master's degree at the University of Pennsylvania. He was assigned to the Far East and later transferred to USARPAC with the 89th Tank Battalion, 25th Infantry Division where he was battalion commander prior to his present assignment as Chief, Armor Section, West Point.

U. S. Army

Ideal surf and gradient conditions permitted rapid tank unloading from LST's.

Advance Individual and Basic Unit Training Programs combat loaded marching (on Territorial highways) with tactics (in small areas), shooting (on Schofield Central Range), followed by resupply and maintenance in the tank park (adjacent to the range). In no case could all activities be done in one location. We were able, however, to have them follow each other so closely as to be practically a single operation. The result has been to develop exceptionally well-qualified individual tank crews and platoons as far as fundamentals are concerned. Actually, on the platoon tests, our platoons marched 125 miles each, as individual units, so the distances are such as would be realistic under almost any circumstances. True, much of this distance was travelled over the same roads in going to successive locations, but their ability to march the cumulative distances effectively was an important fact to note.

Throughout this period, Company and Battalion tactical operations perforce were limited to classroom map and sand-table problems. We had, of course, many tactical periods in the field as companies. It was with considerable interest and anticipation, however, that we received orders in late July 1955, to write and execute amphibious live-firing tank company problems with each of the tank companies in September. The question was, of course, how well the companies could function after having had so little field training in actual tactical movement and operations at the company level. We called the exercise SKYHIGH in dual anticipation of the morale and physical level of the operation which was to be held at Pohakuloa, Hawaii.

The tankers were transported to the Big Island from our home station at Schofield Barracks, Oahu, aboard the USS Crook County (LST 611), a half-company at a time. We landed through the surf at Hapuna Bay, below the maneuver area. This opportunity to practice actual amphibious landings was of particular training value.

Typical of the company exercises was that conducted by C Company. The first echelon of the company left Schofield on a Wednesday and was followed by the second echelon two days later. After an overnight trip the tanks and trucks unloaded on the beach and moved to the bivouac area located on an abandoned air strip. After-fording maintenance was conducted at the bivouac before moving to the problem area.

Sunday afternoon, the company moved up the mountain through the clouds to the Pohakuloa Training Area. Located more than 6,000 feet above sea level, the area includes the lava flows in the saddle between Mauna Kea and Mauna Loa, the two highest mountains in the Hawaiian Islands.

In the tactical asssembly area, we soon learned that the mild, enchanting Hawaiian climate of the beaches does not extend to the Pohakuloa area. Winter underwear, gloves and mountain sleeping bags were appreciated. (Skiing is a popular winter sport on nearby 13,784 foot Mauna Kea).

An added occupational hazard was "Pohakuloa Nose." The result of long exposure to the brilliant sun, this caused some discomfort but healed quickly under treatments of cold cream, sunburn lotion and the like.

Monday's live firing attack was conducted as a flank guard mission against a simulated enemy force entrenched on a cinder cone approximately 1,800 yards off the main Saddle Road. The battalion's mission was to prevent interdiction of the 25th Division's main body in its move through the saddle to the port city of Hilo. Since vehicle movement through the center of the company zone was restricted by rough lava flows, the mission was accomplished by establishing one platoon in the center as a base of fire while the other two platoons conducted a double envelopment of the flanks.

Tuesday an attack was conducted over the same area after a night move to the attack position and a first-light attack. This attack was witnessed by Major General Herbert B. Powell, 25th Infantry Division commander, and a group of Thai officers headed by Brigadier General Bhisit Chaimuanwongsa. The Thai party observed the division's activities under the Mutual Defense Assistance Program.

After securing the intial objective, the company was ordered to continue the attack to a secondary objective in order to prevent enemy observation of the Saddle Road during the division's movement. Subsequent orders required establishment of a company strongpoint as a part of the larger (simulated) battalion mobile defense. Throughout the night, aggressor forces—actually the 89th's Reconnaissance Platoon—harassed the strongpoint, using blank ammunition. The aggressor forces applied psychological warfare through the platoon and company radio channels by interrupting communications with surrender talk such as: "Why don't you give up? We have hot showers and cold beer."

Early Wednesday morning, the flank guard mission ended by completion of the division's move through the saddle. The company then began a phased withdrawal back to the Saddle Road and acted as the division's rear guard. This withdrawal was under constant pressure of aggressor tanks, infantry and air.

After the critique, the company rolled back down the mountain to the bivouac area. After performing maintenance on the vehicles, the company boarded the LST for the trip home. Back at Schofield Barracks, the tankers realized how welcome the comforts of the home camp could be, as they washed off the week's accumulation of lava dust and prepared to continue training.

Each company repeated the problem, under control of a detachment from Battalion Headquarters. The supply, communication, and administrative play was the equivalent of a battalion exercise. Some of the statistics are shown:

1. Miles each company travelled: about 130
2. Rounds 90MM (All types) expended: about 3500
3. Amphibious landing/loadings: 12
4. Vehicles damaged in the water: none
5. Total major vehicular damage: 1 VTR threw a rod on the mountain and burned; 2 oil coolers blown.
6. Serious injuries: none
7. Mistakes made and lessons learned: many
8. Morale: SKYHIGH

A company can be trained, without actual company level tactical operations, to be an effective unit by emphasizing thorough training on the crew and platoon level.

CARDED

Testing Armor in . . . ALASKA

ARMOR IN THE ARCTIC

By *FIRST LIEUTENANT TERRY C. EAKIN*

ARMOR matched wits with the Arctic in the Army's winter maneuver, Exercise Moose Horn, conducted during January and February in Alaska.

A total of five tank companies and some 10,000 troops participated in the maneuver which was held at Fort Greely, the Army's most northern post, located in the Big Delta area of central Alaska.

The purpose of Exercise Moose Horn was twofold: First, to test the ability of troops to move and fight under arctic conditions; and second, to test the relative methods of resupply by airdrop and sled-train. To accomplish these tests the maneuver was divided into four phases, with two battalion combat teams participating in each phase. Each BCT was supported by armor. The 71st Reconnaissance Company, which has a normal light tank company TO&E of 17 M41 tanks, was attached to the 1st Battalion, 53d Infantry Regiment, from Fort Richardson.

This article is not intended to chronicle the daily events of Exercise Moose Horn, but rather to describe armor in the Arctic as witnessed in the 71st Reconnaissance Company and to relate some of the happenings in the company during the maneuver.

The company was alerted several weeks in advance for the maneuver—alerted for a 400-mile motor march over treacherous, ice-coated highways from Fort Richardson to Fort Greely, a week of maneuvering in the Big Delta area, and a 400-mile return march—most of it at below zero temperatures. Thus, preparations were begun early and the maintenance program was accelerated.

Performing maintenance in extreme cold calls for careful supervision by officers and noncommissioned officers, for the men often become so engrossed in their work that they forget about the consequences of the cold. When the temperature is minus 20 or lower, a man's hands can become frostbitten in a very short period of time.

Prior to the 71st Reconnaissance Company's departure for Exercise Moose Horn, the tanks were checked out thoroughly to insure their being in the best possible mechanical condition. Facing the company was a motor march to the Big Delta area from Fort Richardson and back, and the actual maneuver problem, which meant the tanks would be traveling a distance of some 1,000 miles in two weeks.

The march from Fort Richardson to the Big Delta area amounted to more than the mileage covered, for the tankers left the comparatively warm "banana belt" climate of the Anchorage area and journeyed through the rugged Chugach Mountains and the Alaska Range into the central interior of Alaska. North of the range the tankers found deeper snow, higher winds and up to 40 degrees colder temperatures.

During the movement the tankers exhibited their physical stamina. The average time for the motor march between Fort Richardson and Fort Greely, one way, was two days. The average amount of sleep in those days was about three hours, except for the quick snatches of sleep many of the crewmen obtained while still moving.

Some delay during the motor marches was caused by difficulties in refueling. Two methods were employed; one was to have predesignated gasoline points along the highway, while the other method was to have Army gasoline tank-trucks travel with the column. At times the predesignated gasoline points proved to be either too far apart or too close together, or the tank-trucks fell behind the column.

Base camp for the 71st Reconnaissance Company was established at the maneuver area, about three miles from Fort Greely. In Alaska the tankers, like the infantrymen, use the five-man arctic tent which is heated by the almost indispensable Yukon stove. About three times the size of an average shoe box, the stove operates on either gasoline or wood. Each tanker carries an arctic sleeping bag and an air mattress.

During Exercise Moose Horn the tanks were used not only in their normal rôle of furnishing firepower, maneuverability and shock action, but were also incorporated in the BCT's as prime movers to haul two-ton sleds. These sleds carried the infantrymen's extra rations, tentage, etc.

The normal day on the maneuver problem for the tankers began around 0630 hours. C-rations were heated and eaten, the tents folded and loaded, and the tanks gassed. The tanks were then hooked with the sleds and the company moved out following the bulldozers. Each tank usually towed two sleds. The sleds were often overloaded, which resulted in the tanks dragging up to seven tons through the snow. This, many of the tankers felt, overstrained the engines and transmissions. While dragging the sleds through some deeper snow at two or three miles per hour in low range, many of the tanks used as much as ten gallons of gasoline per mile.

Bulldozers were used to clear the

FIRST LIEUTENANT TERRY C. EAKIN, Armor, recently completed two years' active duty, has reverted to Reserve status and is living in Beulah, Colorado. Prior to his assignment to the 71st Reconnaissance Company in Alaska he attended the Basic Course at The Armor School.

trails for the tanks and other oversnow vehicles. In some of the deeper drifts the tankers would have to unhook the sleds and attach two tanks in tandem to gain additional power. Tanks were seen plowing through five and six foot drifts, bellying up, and then backing up for another run, until they were through the drifts.

The noon meal of C-rations was heated by the tank heaters and eaten on the move. After the long day on the trail, at around 2200 to 0200 hours, the sleds would have been delivered to the infantrymen and the tankers would be bedded down for the night.

An engine-warming guard was established in the company each night during the maneuver. The 71st Reconnaissance Company found that, at temperatures below zero, it was best to run the "Little Joes" (auxiliary engines) every two hours and the main engine twice a night.

Generally speaking, the engines performed satisfactorily throughout Exercise Moose Horn. As expected, however, difficulty was incurred, with condensation in the carburetors and fuel lines. Blowing snow, plus ice and snow kicked up by the moving tracks. quickly filled the air cleaners. During the oversnow movements, the air cleaners had to be cleaned two or three times a day.

The final day of each maneuver phase was devoted to a live firing exercise held on a range overlooking the frozen Big Delta River.

The 76 millimeter guns performed satisfactorily. The company, however, did have trouble with ruptured cartridges in the 50 caliber machine guns. One tank commander finally overcame this by setting the head space of the gun at eight clicks.

The firing proved that a tank company's weapons could function in extreme temperatures.

A soldier in Alaska is constantly engaged in one form of deadly combat—the unceasing war for survival against the cold. And for men in the tanks, this cold presents a special problem with the added windchill-factor.

Windchill-factor is a computation derived from below zero temperatures and wind in order to ascertain the effects of the weather on exposed skin. The tank commander and driver are constantly facing a dangerous windchill-factor while moving, because in most instances the exposed flesh will freeze in less than a minute.

The best answer to the windchill-factor problem of the tanker is to move buttoned-up, and this is done whenever practical. In addition, face masks have been tested; however, these masks proved unsatisfactory because no one was able to check the wearer's face for any sign of frostbite.

The most practical method of protection against the cold for the tanker was to use small plastic windshields bolted to the tank in front of the driver and commander, draw the parka hood over the face, wrap a muffler around the lower face, and occasionally move down inside the tank for short intervals.

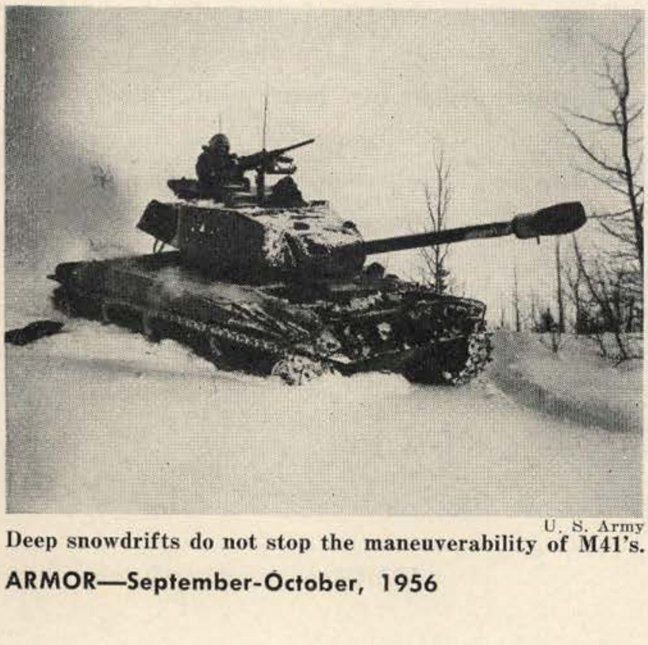
Troops in Alaska wear two main types of winter footgear; the Thermo boot (Korean boot) and the mukluk. The Thermo boot, a rubber boot using the thermos principle for warmth, is warm to temperatures down to minus 20 degrees. However, to keep warm, the foot must be kept moving and exercised. This is easy to do while skiing or walking, but extremely difficult when confined in a tank. The mukluk, patterned after native Eskimo footwear, is supposed to keep the foot warm to minus 60 degrees. A drawback of the mukluk is the fact that, after being wet and then drying out, the sole becomes very slick, thus presenting a safety hazard to the tanker. In addition, the mukluk has no arch support. It is generally felt that the mukluk needs a hard sole, perhaps of rubber, and an added arch support.

Many tankers feel that the clothing worn by Army personnel in the Arctic is too bulky for movement in a tank. Army Quartermaster is working on new types of cold weather clothing.

Exercise Moose Horn proved that the arctic tank company can fulfill the mission of hauling an infantry battalion's supplies over snow in two-ton sleds.

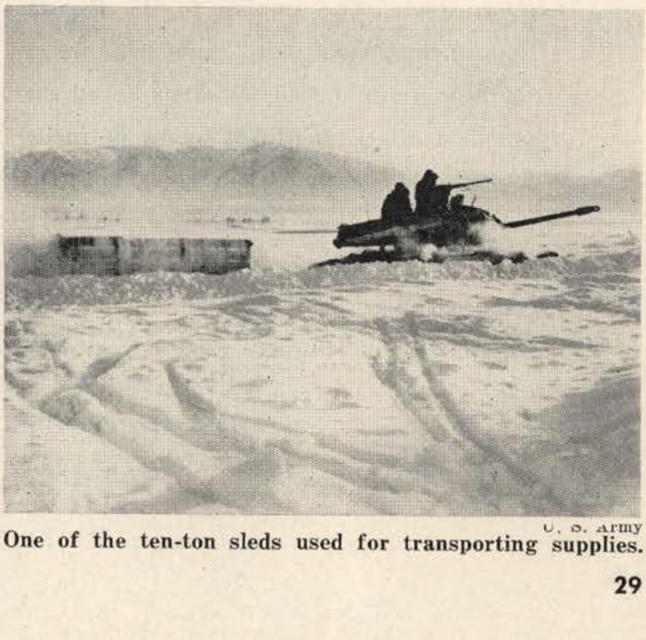
The maneuver also showed that, given time and proper maintenance facilities, the tanks can, in an emergency, travel over 1,000 miles during the coldest months in Alaska and still be able to fight.

And finally, exercise Moose Horn proved that, with proper training, clothing and equipment, no tanker need fear the Arctic.



U. S. Army

Deep snowdrifts do not stop the maneuverability of M41's.



U. S. Army

One of the ten-ton sleds used for transporting supplies.

TOUCHING BASE

Since the last issue was published your editor has had the good fortune to be able to get out of Washington and touch base with Armor personnel at Fort Stewart, Georgia. It was indeed a revelation to find Stewart engaged in so many Armor missions which deal with two National Guard Armored Divisions, many National Guard Armored Groups and Tank Battalions; training and service firing of Regular Armored Cavalry Regiments, Tank Battalions and Tank Companies. In addition there is an enormous antiaircraft firing mission which goes on continuously at Stewart.

Thanks to the hospitality by the permanently stationed Armor personnel and the National Guard AG of Georgia, I was able to see a great deal of the training that is being conducted at Stewart and come away with a greater appreciation for what goes on there.

The amount of good obtained by the units sent to Stewart to train is in direct proportion to the interest and support rendered by the units stationed there. This applies to the Regular and Reserve component units. From what we saw the results were of the highest. It is hoped that personnel stationed there will follow up in the near future with our suggestions and submit some articles covering their duties. This material is not asked for in order to publicize the post or any particular unit. As all should know this is not our editorial policy. However, there are several stories to tell and it is believed that they will benefit our readers. By the time this issue is received your editor will also have touched base with the 40th Armored Division at Camp Roberts and the Armored Training Center at Camp Irwin both located in California. The Camp Irwin story has been pretty well covered in *ARMOR*. However, we will always look at something new which might not have received sufficient coverage. It is also believed that we will unearth some worthwhile material at Roberts concerning Armor and the National Guard. We, also, will gladly accept new membership which leads us to our next subject.

MEMBERSHIP DRIVE AND THE ARMORED DIVISION ASSOCIATIONS

Since early last Spring we have been gathering, through the Secretaries of the various Armored Division Associations, lists of their membership in order that we might acquaint their members with the availability of *ARMOR* and apprise them of the advantages of belonging to the Armor Association. To date ten of the twelve Armored Division Associations have allowed us to use their rosters and we have been promised the remaining two in early September. Of those Association lists we have already contacted, it has been most gratifying to see the results to date. By the middle of September we will have contacted all of them. We wish to express our appreciation to the Secretaries of these organizations for their cooperation and state we are here to assist them in any way possible. In fact it is our custom to publish each year in the November-December issue a list of all the Armored Division Associations, names and addresses of their Secretaries and dates and locations of their 1957 conventions. If any Association has firmed up its plans please send us the information as soon as possible for publication in our round-up of all Armored Division Associations in the next issue.

AN ANNIVERSARY

It was just forty years ago on the 19th of September 1916 that the first tank was committed to action in World War I. The British employed some forty-nine tanks pieced out among four different corps. Of the forty-nine tanks only nine completed their mission, the remainder breaking down either before or during the attack. The French desired to make this a joint effort and have it come as a complete surprise. However, the British decided to go it alone. The French made their first attack on the 16th of April 1917. This attack was also unsuccessful.

It is well to note that from these modest beginnings, which in many cases convinced a great many Army personnel that the tank was doomed to failure, the tank was to appear on the battlefield some twenty-three years later as one of the most deciding factors during World War II. Yes, we have come a long way in the past forty years in the employment of Armor. As for the future we can see no let-up or decrease in the necessity for Armored units. As long as real estate has to be taken and held to wage and win a war there will be a necessity to have a hard hitting Army composed of the ground arms team. This is true despite the claims of the exponents of the air arm to the contrary.

AN ARMOR NEWSLETTER?

If the membership and unit subscriptions continue to roll in—at the present time we are slightly behind last year—we are contemplating publishing a newsletter during the interim month between issues. We feel that this will benefit our members. We hope to keep you informed, particularly of up to the minute newsworthy material, in this way. At the same time we can inform you of what will be forthcoming in the next issue. Any suggestions from any member to assist in getting this project started will be greatly appreciated. As it has been stated on many occasions and it is worth reiteration: This magazine belongs to each and every member. It is not the sole property of the editor. He is strictly the responsible party for putting it together. It is only as good as what you, each and every member, put into it. The target date for starting the newsletter is the first of the new year.

The Editor

An observation type airplane used primarily by Infantry, Artillery and Armored units, the L19 is a tactical two-place low-speed craft.

Message pick-up, wire laying and the rapid delivery of aerial photographs are some of the functions of the L19.

Expert maintenance being performed on an L20, a utility airplane used at division and higher headquarters level.

The L20 can carry a pilot and five passengers or a pilot and three litter patients plus a medical attendent or a pilot and 1000 pounds.

ARMORED DIVISION AVIATION

Experience in Korea indicated the need by forward elements for delivery of supplies, equipment and small units.

In this era of modern warfare, the success of an armored division, be it on the field of training or in a combat zone, is greatly dependent upon the skillful employment of fixed and rotary wing aircraft assigned to the division's Army Aviation unit.

The 1st Combat Aviation Company, an organic part of the 1st Armored Division since 1954, has strived to improve the effectiveness of combat aviation support of the fast moving, highly mobile, ground forces.

During its two years with "Old Ironsides," the Company has undertaken and fulfilled its primary mission of expediting and facilitating the conduct of operations on land; to improve mobility, command, control and logistic support of the division; and to provide greater battlefield dispersion and maneuverability under conditions of atomic warfare. (PIO 1st Armored Div.)

The H23 is a reconnaissance type craft also used for liaison, wire laying, resupply and the evacuation of wounded.

All Photographs U. S. Army

The H19 can carry light cargo, troops and litters. Here an officer signals to the H19 where he wants supplies dumped.

The H23 carries a pilot and passenger inside or a pilot and two litter patients in pods attached to cross tubes outside.

The following article is on a subject which has—for the most part—been neglected by writers on the Civil War. You will find this an excellent piece on . . .

MAPS FOR THE CIVIL WAR

By COLONEL H. V. CANAN

Before the War

ACCORDING to modern techniques, surveying, mapping and map reproduction were still in their infancy during the Civil War period. Although some sketching was attempted from balloons and even pictures were taken from them, surveyors were confined to ground methods. Land held by the enemy could not be surveyed. To survey and map such ground, either the area or a map of it had to be captured.

Captured maps quickly became a prize. The Confederates were able to capture several of McClellan's maps of the peninsula when strangely enough they had but little information of that area. In 1862, the Union army captured a map of Stuart's which showed the roads between Fredericksburg and Gordonsville in considerable detail, at a scale of two miles to the inch. This map is preserved in the National Archives as are several other captured maps which were of equal interest and importance to the Union forces.

The survey and reproduction methods then in use were far from crude. Frequently the lithographic copy of an engraved map of the period is a more beautiful piece of work than is reproduced by modern processes. By present day standards, most of the more carefully prepared maps of the Civil War era would be considered too "cluttered-up." Haschures were used on most maps instead of contours. Instead of using colors, culture was shown by a multitude of conventional signs and a white spot on the paper seemed to be a challenge to the draftsman or engraver for additional symbols.

Prior to the outbreak of the war little thought had been given to the preparation of maps for the battlefield by rapid or by field methods. Fortunately most commanders generally did not expect too much and were easily satisfied, and only a few thousand maps were to be furnished during the war, where for World War II the map requirements for a field army were measured by the ton. Conditions would permit but little new precise surveying to be attempted during operations. The mapping done usually consisted of correction to existing maps or compilations from existing sources. To obtain any speed at all, and speed was essential, surveyors had to use foot or horse sketching or reconnaissance methods, but the speed and accuracy obtained from the methods used were remarkable.

Preparation for War

About 1850 there had been a renaissance in map making throughout the United States. Many mapping and lithographic firms realized the money making potential of supplying maps of various states, counties and cities. These firms included, among others, Lords of New York, Lucus of Baltimore and Barnes of Philadelphia. Buchholtz, under states auspices, produced a good state map of Virginia in 1859. General Meade particularly mentioned Lord's map of Virginia as being a good one. Another map of Virginia of particularly good cartographic qualities published by West and Johnson of Richmond, Virginia was a *Map of the State of Virginia, Containing the Counties, Principal Towns, Railroads, Rivers, Canals and All Internal Improvements.*[1] Although profit was their motive, these publishers filled a long felt want, and the work they accomplished was but an expression of the desire for expansion and growth felt by the nation.

It was due to the efforts of these firms that excellent maps existed for most states. The maps were compiled from various sources, usually on a scale of about one inch equals five miles. They were generally in color, clear, of good cartography, and, in a broad way, fairly accurate geodetically. Because of their small scale, the cultural detail left much to be desired both as to accuracy and completeness. Most of these state maps portrayed political divisions, rivers and drainage, roads, railroads, canals, cities, towns, court-houses, isolated churches and much other general information. Other than by the use of meager haschures little attempt was made to show topography. They usually showed the roads as stage, turnpike or common. Frequently large

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COLONEL H. V. CANAN, Retired, was a 1918 USMA graduate. During World War I he served in the Military Intelligence Division of the War Department General Staff. He served in Europe during World War II on the Staff of the Theater Engineer. He retired in 1954 and is now engaged in consulting work on the Great Lakes.

scale "blow-ups" of railroad alignments were given, together with profiles. Presumably to compensate for other omissions, much statistical data was usually printed on the maps, such as populations and elevations. Although these maps were painted with a broad brush, they were not a bad intelligence document.

Nevertheless there was a lack of large scale maps by which military operations could be conducted or troops moved in multiple columns. Some felt that the fact that generals were fighting in their own country without knowing where they were or where they were going was an ironic example of unpreparedness.[2] There were two schools of thought to that. A lack of maps generally favors the defense. Since the South was going to fight a defensive war, there were those in high places of the South who thought it better to get along with guides.[3] This was probably on the basis that if one side has maps of its own country, sooner or later, and probably sooner, the enemy will secure copies of them. This type of thinking restricted map issues in the South, often to a point that operations suffered. However, it caused the North to survey and make its own maps of Confederate territory. Because map issues were restricted in the South, and because large portions of the area remained long in the hands of the Confederates, no adequate and accurate maps of Northern Virginia became available to Union forces before July 1863. It must be admitted that the condition was decidedly advantageous to the South.

Topographical Engineers had been a separate corps in the Army of the United States since 1838. Their work had been confined largely to exploration and building of military roads in the West, and work on navigation projects other than on the seacoast.[4] They had done little toward mapping the area which was to provide the battlefields for the war. However, for coastal areas the United States Coast Survey maps existed, and it was a poor sort of place that did not have some form of county or city map. During the operations, McClellan, Meade, Lee and other commanders repeatedly mentioned the absence of reliable detailed maps. But then, detailed maps scarcely exist today in the United States except for a few especially prepared maps of maneuver areas, and in Europe but for a few areas over which armies have repeatedly fought. The detailed maps for the Civil War would have to be prepared as need arose.

Extract from Bucholtz Map—State of Virginia, 1859.

The war between the states was unique in that each side had a detailed knowledge of the other which is unusual in war. While travel was not as extensive as it was to become in the age of the automobile, intercourse between the Northern and Southern states was far from uncommon. In the ranks on both sides could be found individuals well acquainted with almost any vicinity of the country of their enemy. For example, on his raids into Pennsylvania, Stuart would have as guides and as sources of information, soldiers who had lived in the area.[5] In addition to individuals, encyclopedias, atlases and government publications were easily available to give statistical data when needed. But guides and information could never quite replace the map. The map was the commander's most important intelligence document. Without maps, warfare on a major scale was most difficult.

Although the small number of roads helped to keep the traveler from getting lost, the roads themselves complicated the problem of the general lack of maps. Other than by milestones on some of the more important turnpikes, roads were not marked nor posted as they are today. The saving grace was that the people were more self-reliant. They had not become accustomed to all the aids which are now given the traveler. The average soldier was a country boy, but even the city-bred were not entirely lost in an unmarked, unmapped area. They all had some sense of direction and a sense of topography. It was natural for them to pick up the North from the stars, the sun or the barks of trees. They lived closer to the ground and could read the signs of nature, where the present generation would be helplessly lost without a map.

In spite of conditions existing at the outset, this first of modern wars was to require maps on a scale heretofore unprecedented. The situation was one which would challenge commanders and topographic engineers, and would require their greatest initiative and ingenuity to keep abreast of requirements. The following sources existed for the topographical engineers when the war broke out:

1. Various State Maps.
2. La Tornette's Sectional Map.
3. U. S. Land Survey Maps.
4. Official County Maps.
5. Official City Maps.
6. U. S. Coast Survey Maps—which covered a part of the settled portion of the United States.
7. Original surveys and reconnaissances to be made on the ground.

Neither the Confederate nor Union army commmanders wanted nor were ready for the First Battle of Bull Run. General McDowell had but the sketchiest sort of a map with which to conduct his march from Washington and to fight the battle. It was on a scale of about an inch to the mile and was but slightly better than the smaller scale state maps. The Confederates were scarcely better supplied, although they had the advantage of being on the ground longer and being able to learn the terrain.

Confederate Mapping

At the outbreak of the war the map situation for the Confederates was most alarming and they were slow to correct conditions. By the time of the Peninsula Campaign in 1862, still nothing had been done. Brigadier General (later Lieutenant General) Richard Taylor was especially critical of the high command of the Southern forces for not providing better maps for that campaign. No more concise but complete picture can be given than to quote him. He said:

> Confederate commanders knew no more of the topography than they did about central Africa. Here was a district but a days march from Richmond, and about the first spot to be settled . . . yet we were profoundly ignorant of the country, [and] were without maps, sketches, or proper guides . . . Remember McClellan had been operating there for weeks. Johnston had been a topographical engineer, Lee had been on duty in the War Office, had been an engineer, had been at West Point and had served several years there, and then to think of our ignorance of the ground on which we fought. McClellan had a superior knowledge of our own land and his retreat was due to this knowledge as well as his ability.[6]

Taylor felt that while Lee's strategy was good, tactics were poor because of the lack of knowledge of the terrain. Major General D. H. Hill found that the Southern engineers had little knowledge of the country and the maps they furnished division commanders were worthless. In one case, a red line furnished with no points marked on it, drawn on an unsurveyed portion of the map, was the only guide on which a march was to be made.[7] Although the Confederates had ample warning of the direction of the attack, yet they failed completely to anticipate the need of topographic information.

About all the Confederates had to start with as regards topographical information were incomplete tracings of an old 1859, nine-sheet map of Virginia of a scale of one inch equals ten miles, plus some 1840 coast charts which showed little of the interior. The mapping responsibility had been left to the Engineer Department. When Major General Magruder's engineer asked in 1861 for maps of the peninsula, about the only satisfaction be got was the reply that maps were scarce.[8] This lack of maps was partly due to the military ignorance of higher authorities who persisted in believing that guides would serve in lieu of maps. It took battles and loss of life to prove the fallacy of this idea. The higher military command also failed to realize planning, time and personnel were required for map preparation. General Johnston and others early stripped the Engineer Bureau of officers for service with the field commands. Then during the Peninsula Campaign, the necessity for preparation of the defenses of Richmond placed an urgent demand for engineer officer personnel. Topographic work had very low priority.

There is little doubt that Confederate operations in the peninsula were handicapped by lack of topographical information. Jackson's inability to do better shortly after his arrival on the battlefield, as well as other Confederate failures to achieve greater success can be laid to lack of maps. The one copy of the only satisfactory map available was in the hands of Lee who quickly took steps to have the deplorable map situation corrected as far as his army was concerned. As soon as possible he organized a topographical bureau to procure accurate maps for his own use and for the use of his senior commanders. Albert H. Campbell was commissioned as a captain in June 1862 and placed in charge of this work. Campbell established an office in Richmond and although he was chief topographer for the Army of Northern Virginia, he also acted as assistant to Colonel J. F. Gilmore, Chief Engineer, C. S. A. After the Seven Days' Battle in the peninsula he was furnished personnel. Campbell's office in Richmond became recognized as the map bureau for the Confederacy, and he went as far as it was possible to correct the mapping situation.

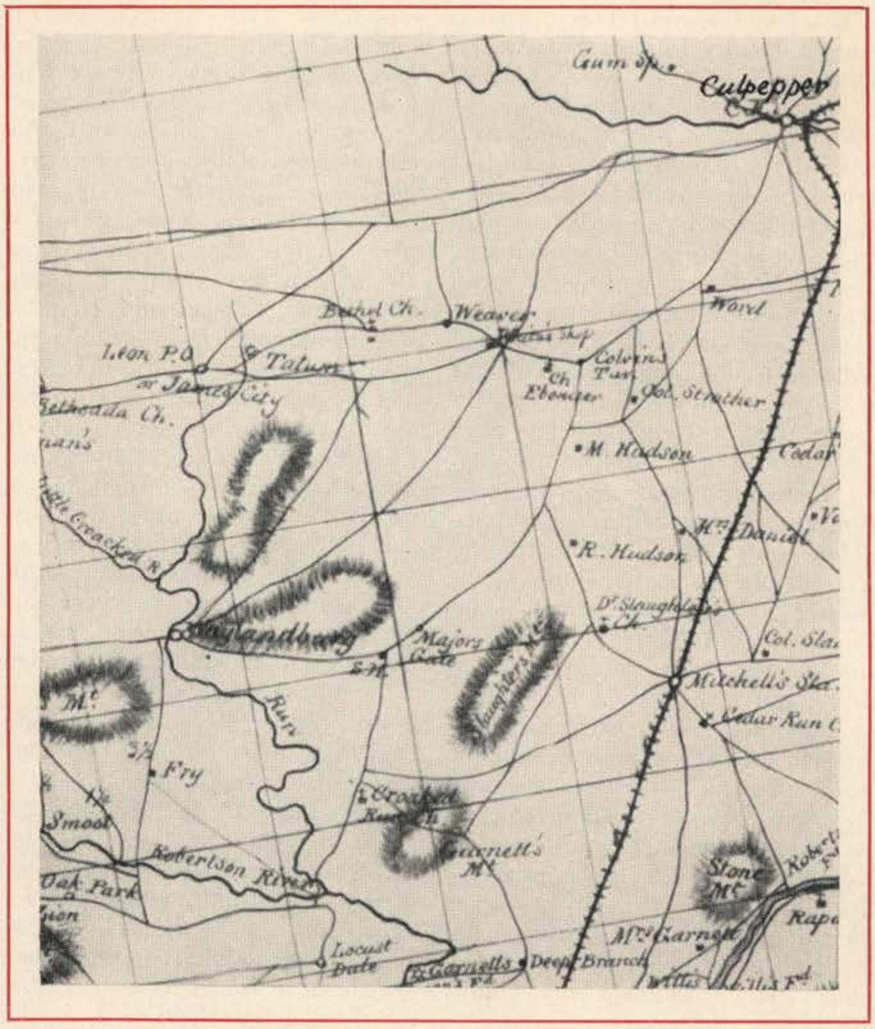
The story of Confederate mapping is one of acute shortage of instruments, tracing linen, paper, inks, pens, chemicals and other essentials which we take for granted with so little thought. Not only was the South scoured for supplies, but attempts were made to get them from England and through the blockade. It was a big day when drafting supplies could be captured.

By the end of the Summer of 1862, the old map of Virginia had been revised for military purposes. Campbell was able to send out many survey parties into the field and eventually had 13 parties working, as well as receiving information, topographic reports and assistance from the topographers assigned to subordinate commands. When Lee moved into Maryland in September he was furnished with a copy of a map of Washington and its defenses, as well as much other geographic material. By the end of the same year Campbell had a sizable number of maps prepared, and a lithographed map of the "Seat of the War" had been sent out. Among the most important of Campbell's accomplishments were maps of the various counties of Virginia on fairly large scale which he had prepared and from which greater detail could be secured as needed in the preparation of special maps. Most maps issued were of a scale of an inch to the mile. To preserve secrecy, only the commanding general and his corps commanders were given the entire map of general areas,—others were given but a portion.

When he first started working, reproductions could only be by hand methods, by laborious copying. Reproduction in quantity by lithography took an extended period, but soon reproduction by photographic means came into prominence, and became the method most commonly used. However, supply of chemicals and paper was always a problem. The photographic reproductions of the maps issued by both sides were the same,—similar in appearance to modern, but poor quality brown-line prints. Sunlight was used for exposures. The shortage of materials, coupled perhaps with the overly cautious desire to preserve secrecy, kept map issues in the Confederate Army of Northern Virginia to a very low level. For example during the month of September 1864 when Grant was before Richmond, only 89 copies of prints of maps of Virginia and of the area in and about Richmond were issued, hardly an impressive total.

When Richmond was evacuated on the night of April 2, 1865 Campbell, by then a major, packed up all of the master sheets of the maps of the Engineer office and placed them on an archives train bound for Raleigh, North Carolina in charge of an engineer officer and a draftsman. He never learned what happened to the sheets although it is popularly believed that they were burned. Campbell afterwards said sarcasticlly when commenting on the loss of all his efforts, that they were burned "to assure their safety."[9]

Campbell was not the only source of maps for the Confederates or for Lee's army. The office of the Chief Engineer of the Confederate army continued to issue maps. In Lee's army, the various corps had topographical officers. These acted as guides and reconnaissance officers and supplied their commanders with hand drawn maps as required. Jeb Stuart had W. W. Blackford, who later became better known as an author. Best known as a topographer was Jackson's Major Jed. Hotchkiss, whose maps were a work of art. Many of them can be found in the Hotchkiss collection at the Library of Congress.



Extract of map captured from Jeb Stuart.

Jedekiah Hotchkiss was born and educated in New York. In 1848 he moved to Virginia where he worked as an engineer. At the outbreak of the war, he volunteered his services as a topographer to the Confederacy and was assigned to duty at Rich Mountain under Colonel M. M. Heck. Later he served with General Lee in the same area. In March 1862 he was assigned to the staff of General T. J. (Stonewall) Jackson. After Jackson's death he served with Generals Ewell and Early. Immediately after the war, the Union forces recognized his ability and he did some work on the maps of the battlefields. He then settled in Virginia as a consulting engineer, surveyor, businessman and historian. His maps were executed with exquisite craftsmanship. Jackson was always foresighted where maps were concerned, and between January and April of 1863 had Major Hotchkiss prepare a most remarkable map of the country between Winchester, Virginia and the Susquehanna River. This map was compiled from county maps of Virginia, Maryland and Pennsylvania. It was on a large scale and noted farm houses with names of occupants.[10] Undoubtedly the map of Franklin County, Pennsylvania "liberated" by Captain W. W. Blackford in Mercersburg during Stuart's raid into Pennsylvania in October 1862 played its part in the compilation.[11] The final map was used by Lee during the Gettysburg campaign. The date that this map was started might indicate that the decision to invade Pennsylvania was far from being on the spur of the moment. A copy of this map can be seen in the Hotchkiss Collection in the

Library of Congress. The original is in the Hanley Library, Winchester, Virginia.

The Confederate armies in the West seemed to have generally prepared their own maps. General Wheeler, the cavalry leader, had a topographer whose work was outstanding in clarity and completeness. Samuel Lockett, topographer at Vicksburg and for the Department of Mississippi, did good work. R. J. Riddle of Macon, Georgia, made maps by the photographic process for the Confederate Army of Tennessee,—but again they were issued in limited quantity.

A few Confederate maps are to be found in the National Archives. These were usually obtained during the capture of a headquarters file or were found on the person of a captured or dead officer. They are of the greatest value since they show the actual map used in battle. Frequently they were prepared by photographic means but often manuscript maps were used. In the collection is an original copy of a map Stuart used as well as an original Hotchkiss map. No lithographed captured maps are there. These captured maps indicate that the Confederate maps were far from elaborate. They eventually became a part of the map bibliography for Union mappers.

It is true that the Southern armies did have maps. Some of them are very good, but by modern standards, or even by the standards of the Union armies the numbers furnished were negligible. Normally the division commanders would only be furnished sketch maps and it was a lucky brigade or regimental commander who had any map of the terrain on which he was to fight or maneuver. Maps made after the battles for the after-action reports were almost always of good quality and much better than the maps with which the battles were fought. Whether the shortage of maps was the cause or not, it is noteworthy that the Southern officers more than made up their deficiency in printed topographic information by aggressive reconnaissance, a matter in which the Union armies were generally deficient.

Union Mapping

The fact that the Union forces were able to retain possession in Washington of the Topographical Bureau of the Army Topographical Engineers, together with its files and most of its personnel, should have given that army a decided initial advantage in topographical work. But the retention of this bureau did not provide a satisfactory flow of maps in the early days of the war. The troops in the West had no maps at all but they were slightly better off in the East. Perhaps initially, there was insufficient liaison between the troops in the field and the Bureau in Washington, or it may have been that the bureaucrats resisted change in their precise, methodical procedures. Lack of continuity of command in the Union armies during the early part of the war and the absence of a long-range operational plan made it difficult to institute a practical mapping program. Maps could not be made over night. At any rate through 1863, it seemed impossible to forecast probable areas of conflict and have enough satisfactory maps available with which to fight battles.

It was necessary that McClellan attempt to produce his own maps for the Peninsula Campaign. There were to be no satisfactory maps even for Chancellorsville or as late as Gettysburg. Before the Bureau is condemned too much, it should be realized that the Confederates held most of the land which should have been mapped, and that the bulk of the topographical personnel was with the armies in the field in staff or command capacities. The Union forces would make maps when they had the opportunity, and like the Confederates, their maps accompanying after-action reports were usually better than the battle maps. During the campaigns there was seldom time or opportunity to map and Colonel N. Michler, a topographer with the Army of the Potomac in 1864 and 1865, admits that it was really after the surrender when the topographers started in on their detailed maps.[12]

After the outbreak of the war, the Chief of the Topographical Engineers tried to carry on as usual instead of taking extraordinary steps to get the necessary mapping accomplished for the Union army. He preferred to place responsibility for any move on Congress rather than doing essential work and getting authority after the fact. During an active war, when Washington was filled with enemy agents, in his annual report for fiscal year 1861, he recommended to Congress that the security of his office in the Winder Building be improved by providing shutters, and that iron filing cases be provided for maps. He also saw fit to recommend that the government retain ownership of the engraved plates when contracting for a specific number of map copies, so that a second printing could be had at a lesser cost.[13] Although a war had been going on for some months apparently the possibility of the need of speed of reproduction had not yet occurred to him as the best reason for retaining the plates. Colonel John J. Abert, the chief, was 68 years of age when the war broke out. He retired in September of that year and was relieved by Colonel Stephen H. Long who remained as chief until the Corps of Topographical Engineers was consolidated with the Corps of Engineers on March 5, 1863. From Abert's retirement on there was constant improvement. One of the first steps taken was to see that all armies in the field had assigned to them topographical officers or other qualified personnel to the extent the means permitted.

For the early part of the war, the number of map sheets printed by the Bureau is not available, but the report for fiscal year 1863 indicates that a total of 8,841 map sheets were printed of which 6,927 were engraved and 1,941 had been reproduced by photographic processes. For fiscal year 1864, the Chief of Engineers reported that the topographical branch had furnished 20,938 sheets and in fiscal year 1865 the total was 24,591.[14]

During the war, Congress kept a tight rein on the army and on the Secretary of War and required the Secretary to list all contingent expenses of his office in his annual reports. All of the items make interesting reading, but his expenses for maps and map work are quite revealing. Some of the expenses were:

7/14/63	17-copies of maps of Washington and fortifications—$17.00;
8/10/63	Printing paper and posting relief map for battlefields, 5,000 copies—$12.50;
9/30/63	1—Map of Tennessee, mounted—$2.00;

10/17/63	For backing 11 maps on muslin—$63.50;
2/17/64	1—Set of American Cyclopedia—$66.00;
3/16/64	4—Maps of Washington —$4.00; and
4/28/64	For backing of a map of the Southern States and Territories—$6.00.

On October 28, 1863 the purchase of 12 dozen spools of red tape at 40-cents a dozen was reported. It was no wonder that when General Grant assumed command of the armies of the United States, he moved his offices to the field so that he would not be handicapped by such trivia.

As the war went on, maps became more commonplace than would be indicated by the totals given in the annual reports. Although chief reliance was placed on the Topographic Bureau by the armies in the East for finished topographic maps, many maps were prepared and printed in the field, usually by photographic processes for which few records are now available. Maps are to be found in the National Archives indicating possession by officers as low in rank as lieutenants on staff duty. One file of maps there is most interesting,—the atlas of maps used by General J. G. Barnard, Chief Engineer of the Army of the Potomac. These maps are in the cardboard folders as he used them. While there are more titles than one would expect to find, there are few general maps but chiefly maps of places for which he might have a map need. Few lithographed maps are in the atlas, and few map manuscripts. Most of them were reproduced by photography.

Being an engineer, Major General George B. McClellan was acutely aware of the requirement for maps. Soon after he was given command of the Union armies, he directed his topographical engineers to prepare a map of Northern Virginia.[15] The area was too vast to cover adequately, although a great deal of material was gathered together which was of some value later. Shortly after Brigadier General A. A. Humphreys was appointed Chief Topographical Engineer of the Army of the Potomac, the Peninsula Campaign was decided upon. With the area of operations pinpointed he could go to work in earnest.

There was a complete absence of reliable topographic maps in the area in which they were going to fight. It it true that some of the spies of Pinkerton, McClellan's Chief of Secret Service, had gone into the peninsula and brought back information on the topography and on the roads and bridges, but the information must have been misleading since the terrain was more thickly wooded than had been expected, and there were dirt tracks where McClellan had been led to believe he would find good roads. The information secured by the spies in no way lessened the work of the topographers.

General Humphreys gathered together a small force of topographical officers, civilian members of the U. S. Coast Survey, and other civilian engineers to compile and prepare battle maps. Frequently it would be necessary to carry on survey operations under fire and McClellan admits that sometimes the movements of the army were delayed due to difficulties of obtaining knowledge of the country in advance. However, he claimed that the results of their labors were the preparation of a series of maps which were invaluable to the armies afterwards traversing the same ground.[16] If true, it would have been a remarkable performance even in this day of aerial photography. In spite of the most strenuous efforts of his topographers, McClellan really found the maps they produced were quite unreliable. There was not too much detail shown on the maps. Roads and drainage were portrayed, but no contours. It is doubtful that all roads were shown, and if those shown were quite accurate. The maps were hardly better than the average reconnaissance map. An appraisal of their worth could be made when General U. S. Grant was in front of Richmond in 1864 and 1865. Maps for Grant's campaign were suitable only for general information but not for military operations. Therefore it was necessary that the work of McClellan's topographers be completely redone in 1864 and 1865.

This work of the topographical engineers with the Eastern armies is quite well described by Colonel N. Michler, topographical engineer assigned to the Army of the Potomac. His report of topographical operations describes how the topographical engineers provided maps for the advance from the Rapidan to Petersburg in the latter part of the war.[17] The movement of the army during May and June of 1864 had shown that the existing maps were satisfactory for general information only, and indicated that accurate maps, topographical information and engineering information were all necessary. The operations in Virginia between the Rapidan and Mine Run between August and November of 1863 had furnished considerable topographic information, reconnaissance had been made of all fords, and the country was generally well known but that was about all. The peninsula was not much better. There was practically nothing in the engineering archives about the area.

Since there was so little detailed information available, hard work for the topographers was indicated. The topographical group with the Army of the Potomac consisted of two officers, seven civilian engineers and some enlisted men. This group pushed reconnaissance and surveys ahead of the troops to the extent practicable. Every road was examined and surveyed. Notes were photographed at once and distributed for use. Eleven maps with a total of 730 square miles covered the advance. These maps were kept under constant revision, and were photographed and a distribution was made whenever necessary. Six other sheets were improved by 129 miles of survey by odometer with the headquarters train. Where necessary the barometer was used for elevations. Three hundred and ten miles of other traverse was made by the cavalry expeditions under General Sheridan. Captured maps were used extensively in map revision.

After July 9, 1864, when the Union army confronted the Confederate entrenched position at Petersburg, a survey was made of the country and the position of the armies of both sides. The map was kept under continuous revision and was in constant reference during the siege. The survey work for the project required some 1300 miles of survey.

Over 1200 map sheets were prepared and issued by the Army of the Potomac prior to the crossing of the Rapidan in May 1864, and 1600 photo-sketches were issued between that time and the end of July. These maps were in addition to any prepared by the Topographic Bureau and shows that the work load of the topographic section of the army at times approached nearly 1,000 maps a month.[18] Compare this to the 89 maps from all sources issued in the Confederate army during the same period.

The Union armies in the West found that maps there were almost non-existent. The country was younger and was not as developed as was the Eastern theater. Maps of the State of Mississippi and maps and charts of the Mississippi River were quite sketchy. Therefore at the start of the war the Union troops could be furnished but scantily with skeleton outline maps. When Halleck campaigned there in early 1862 he had to run his campaign with maps he purchased from a book store. He quickly put topographical officers and civilian engineers at work, but as was always the way when surveys and reconnaissance are rushed, the results were none too accurate.[19]

Sheridan in the later part of 1861, found it necessary in the West to fall back on his West Point training to compile some rough maps for himself and his regimental commanders. He took great pride in his maps since they could be readily understood. The maps gave details of roads, farm houses, streams, swamps, fields, woods and other features which would be of value in military operations.[20]

General Sherman seems to have been the most concerned about maps. Perhaps more than any other officer of the North or of the South, he realized that the war would be won by those who knew the ground best. About the first thing he did after arriving in Kentucky from the East was to devote a considerable portion of his time to making a map of the surrounding country. As time went on he more fully reconnoitered the country on horseback for miles around and filled in details of the terrain and the culture.[21] At the battle of Shiloh in April 1862, he personally prepared a manuscript map which he loaned to General Buell on his arrival, but only after securing promise of its return. If it had not been for this map, Buell would have come on the battlefield with no map, little knowledge of the area, and no time for reconnaissance.[22] When Sherman moved over to the Mississippi in December of the same year he still continued his personal interest in maps and for his attack up the Yazoo gave each of his division commanders a copy of a map which he said was compiled from the best sources, and in the main was correct.[23]

Grant did not appear to be as acutely concerned about mapping as was Sherman, but he was a more patient man who was willing to wait for conditions to improve. However, when he desired to have a meeting with Sherman he was willing to take advantage of Sherman's initiative in getting maps. He told Sherman to bring along a good map of the country if he had one. It is true that mapping conditions in this theater did improve. From the most meager beginnings, the Union army in the West went a long way in mapping before the war was over and probably did more to advance field mapping and field reproduction methods than did the headquarters in Washington.

In spite of various handicaps, the greatest development in mapping was made in the Army of the Cumberland. Captain (later Colonel) Nathaniel Michler was appointed Chief Topographical Engineer of that army on October 21, 1861 and remained in that capacity until he was relieved on May 31, 1863 by Captain (later Colonel) W. E. Merrill. Captain Michler subsequently went with the Army of the Potomac, and his work with that army in 1864 and 1865 has already been described.

Because of the great distance from Washington, the armies in the West could not depend on the Topographical Bureau in Washington for maps. The engineers assigned to the various commands were more than capable of meeting the challenge presented when they had the opportunity. Their efforts were so effective that the Western armies were probably better supplied with maps than were those in the East. Michler started the advance in mapping, map reproduction and map supply. In December 1862, General Orders provided that in the Army of the Cumberland, an acting assistant topographical engineer would be designated in each corps, division, and brigade. Other armies in the theater were not quite as well provided with topographical officers, but their means were adequate. Unfortunately there was a clash of personalities between Michler and General Rosecrans, the army commander, and Michler asked to be relieved.

The fault could not have been all Michler's as there is evidence that Rosecrans did not have proper appreciation of maps, mapping or other engineer problems. After Rosecrans had been relieved during the siege of Chattanooga, and Major General George H. Thomas had just taken command of the Army of the Cumberland, Major General U. S. Grant, who commanded all troops in or ordered to Chattanooga, wrote to Thomas as follows:

> "General:
>
> All preparations should be made for attacking the enemy's position on Missionary Ridge by Saturday morning at daylight. Not being provided with a map giving names of roads, spurs of the mountain, and other places, such definite instructions cannot be given as might be desirable. However, the general plan . . . is . . . "

This condition existed after Michler had been relieved and the very able Merrill had taken over, and the Army of the Cumberland had been in position for some time. No reason for there not being a map available can be attributed at this time. Given the opportunity Merrill would have mapped the position without orders. Probably he was left with other Department headquarters personnel in

Scales for the Theater

For areas of 2 square miles or smaller, ...	6 inches equals one-mile.
For areas of from 2 to 4 square miles, ...	4 inches equals one-mile.
For areas of from 4 to 8 square miles, ...	2 inches equals one-mile.
For areas larger than 8 square miles, ...	1 inch equals one-mile.

Figure 1

the rear. The army staff could not function properly without assistance and direction from the army commander.

On assuming his duties on May 31, 1863 Merrill used Michler's work as a stepping stone and continued where possible to improve the topographical service being rendered. On the day he assumed his duties, he caused a general order to be published which provided that each Brigade Topographical Officer would report weekly, furnishing copies of maps, reconnaissances and other topographical information to the Division Topographical Engineer who in turn would consolidate the information received from all his brigades and send the report on to the Corps Topographical Officer. The Corps Topographical Officer would consolidate all of the reports received from his divisions and send them to the Chief Topographical Officer of the Department. The Department Topographical Officer would instruct subordinate elements on the work to be accomplished. To assure coordination and to keep major commanders from placing their topographical officers on work not contributing to the survey mission of the army as a whole, commanding generals were charged with assuring cooperation of their topographical officers with the general topographical program.[24] It was an excellent program if it had been allowed to work. It really was not until Sherman assumed command of the Military Division of the Mississippi that his great interest in maps had influence on the Army of the Cumberland and on other troops in the Western theater.

The maps scales provided for the theater were quite practical and were based on the size of the area mapped rather than on a specific purpose to which the maps would be placed.[25] *(See Figure 1.)*

Usually state maps prepared by commercial firms were available when maps of large areas were to be studied.

The Army of the Cumberland found it necessary to specify that maps were not the personal property of the officers to whom issued, but must be left behind when commanders were transferred.[26] Although there was usually an adequate supply of maps located in the Army of the Cumberland there was never a surplus of maps to be found anywhere.

During the early years of the war, the Army of the Cumberland depended chiefly on photography for map reproduction. This method was found unsatisfactory because of inaccuracies in the map borders caused by lens errors, because the maps faded in the sunlight and because copies could not be made during rains or at night. The method was slow and sufficient copies could not be made even on a good day. Therefore the army established a complete reproduction plant of its own in the office of the Chief Engineer, consisting of one printing press, two lithographic presses, photographic equipment and map mounting facilities, manned by draftsmen and other assistants.

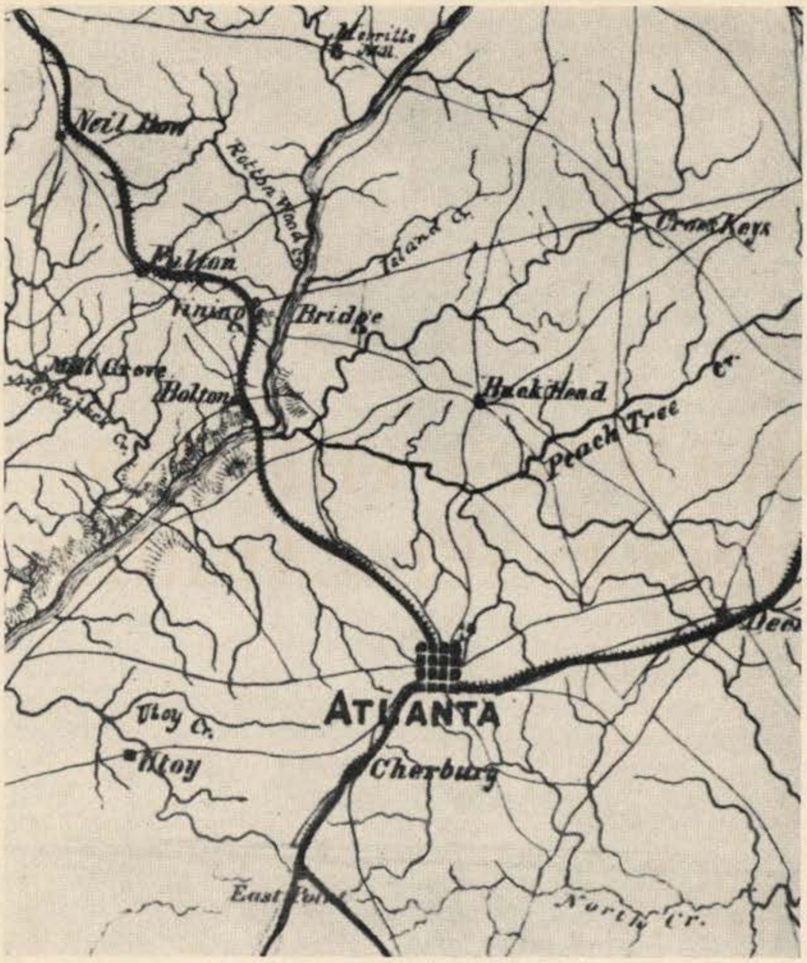
These arrangements proved satisfactory while the army and the department headquarters were relatively stable. It was believed that the lithographic stones would be too heavy to transport in a moving situation and a patented method developed by Captain W. E. Margedant, an assistant topographical officer in the headquarters, was adopted. This was a facsimile photographic method and required only a light weight box containing several nested rubber baths and the necessary chemicals. It was contemplated that the lithographic stones could be left behind at the engineer depot nearest the front.

Under the Margedant method, the map was drawn in ink on thin paper. This drawing was placed over paper which had been coated with nitrate of silver and exposed to the sun. The sun's rays blackened the prepared paper except under the inked lines. When the prepared paper was finally treated and "fixed" the copy consisted of white lines on a black background, somewhat similar in appearance to the present day blueprint. Under this new method, corrections were easy to make on the drawing and new editions could be gotten out without difficulty.

Maps prepared by this method carried the notation "Captain W. C. Margedant's New Method of Quick Field Maps." Since this notation was placed in ink on the original drawing, the notation also appeared on the printed map in the event the map was later lithographed. Several of the lithographed maps appearing in the Atlas of Maps with the Official Records of the War of the Rebellion carry this notation. While the method was better than reproduction by photography, it had its objections. It still was expensive. Large numbers of copies could not be made and when it was used maps could be distributed only to commanders of the major units.

Apparently the Army of the Cumberland found occasion to retrieve their lithographic stones from time to time. It fell to this army to prepare the general map for the Atlanta campaign. The best available map of North Georgia was obtained and enlarged to a scale of one-inch equals one-mile. Prisoners, spies, refugees, peddlers and all others who might have information were interviewed so that the information given on the base map could be elaborated. Sergeant Finnegan, 4th Ohio Cavalry, on duty in the Army Engineer Section was particularly good in extracting information of the sort needed and soon he had enough corroborated information so that work could be started. Using the enlarged map as a base, the additional information was placed upon it. The map was then cut into 16 sections and given to draftsmen who worked night and day on the sections. When four adjacent sections had been completed they were transferred to lithographic stones and 200 copies were printed. The maps were then mounted and initially given only to the senior generals so that the march could be started. Mounting of the maps was the bottleneck, but as this progressed maps were finally issued down to include brigade commanders. Maps for the cavalry were printed on muslin and issued. Officers would bring in handkerchiefs and have the map or portions of it printed on them.

As the army advanced, the map naturally became less accurate. It had been impossible to get details too remote from where the maps had been prepared. It was still a good map, and because everyone had the same map there was less confusion in the command. Merrill believed that the army Sherman led to Atlanta was the best supplied with maps of any army during the war. The map he later used for his march to the sea, while adequate was not as good. Facilities and data were not available for its preparation to the extent they were for the Atlanta campaign map.



Extract of Union Map of Northern Georgia.

Although the Army of the Cumberland went only as far as Atlanta with General Sherman, Captain (later General) O. M. Poe, Chief Engineer of The Military Division of the Mississippi, adopted many of the ideas of the Army of the Cumberland. By Field Orders No. 1, dated May 31, 1864 it was prescribed that no topographical officer would be used as an aide-de-camp or for such prosaic duties as camp site selection. On the march these officers were to be used to survey routes and at temporary halts would make such surveys as the Chief Engineer would prescribe. The commanders were still charged with assuring cooperation. During the march eastward from Atlanta, the topographic branch worked effectively and surveys were completed of all routes of advance by odometer and prismatic compass, and surveys made of all parapets or fortifications constructed. In all, the following number of miles of road were surveyed and mapped:

Atlanta Campaign	980 miles
Savannah Campaign	1700 miles
Goldsboro Campaign	2500 miles
March to Washington	1600 miles

Final Results

Although the Union forces may not have had good maps for all the battles they fought, once the battle was over and provided they had the opportunity, they would jump in and survey the field. Hence if they had occasion to go back into the area, they usually had a good map of it. As was the case with the Confederate army, maps accompanying the Union army after-action reports were usually of good quality. Maps in the Atlas of the Official Records of the War of the Rebellion are generally of good cartographic excellence. Some maps were especially surveyed for the Atlas, others were immediately surveyed after the action, and a few were the maps which were used during the battle. Because of the excellence of the maps in the Atlas, a mistaken idea has grown up that commanders of both sides were adequately supplied with maps. The contrary was usually the case. The war taught the American army the requirements for maps and the necessity of making provision for them so that they would be available when needed.

Giving proper consideration to the shortages and other difficulties under which the Confederate army operated, it still appears that the Union armies had the greater appreciation for maps and were more aggressive in supplying them. Although the map shortage may have caused the Confederates to be more reconnaissance-minded, still the problems of their military leaders would have been lessened had there been greater dissemination of maps in the lower elements.

FOOTNOTES

[1] Henry Kyd Douglas, *I Rode with Stonewall,* (Chapel Hill, 1940), p. 42.

[2] T. Harry Williams, *Lincoln and His Generals,* (New York, 1952), p. 5.

[3] Albert H. Campbell, Article in Century Magazine, Vol. 25, 1888, pp. 479, 481.

[4] Annual Report o fthe Secretary of War, Fiscal Year 1860.

[5] W. W. Blackford, *War Years With Jeb Stuart,* (New York, 1945), p. 172.

[6] Richard Taylor, *Destruction and Reconstruction,* (New York, 1879), pp. 76, 97.

[7] D. H. Hill, *Lee's Attack North of the Chickahominy,* (Battles and Leaders of the Civil War, The Century Magazine, 1884-1887), pp. 352, 361.

[8] James L. Nichols, *Confederate Map Supply,* (Article in The Military Engineer, Jan.-Feb. 1954), pp. 28-32.

[9] Campbell, *op. cit.,* p. 481.

[10] E. P. Alexander, *Military Memoirs of a Confederate,* (New York, 1907), p. 332.

[11] Blackford, *op. cit.,* p. 165.

[12] Annual Report of the Secretary of War, Fiscal Year 1865, p. 927.

[13] Annual Report of the Secretary of War, Fiscal Year 1861, pp. 129, 130.

[14] Annual Reports of the Secretary of War for Fiscal Years 1863, 1864, 1865.

[15] George B. McClellan, *McClellan's Own Story,* (New York, 1887), p. 180.

[16] *Ibid,* p. 125.

[17] Annual Report of the Secretary of War, Fiscal Year 1865, p. 927.

[18] *Ibid,* p. 927.

[19] T. Harry Williams, *Lincoln and His Generals,* (New York, 1952), p. 5.

[20] P. H. Sheridan, *Personal Memoirs of P. H. Sheridan,* (New York, 1888), Vol. I, p. 155.

[21] Lloyd Lewis, *Sherman, Fighting Prophet,* (New York, 1932), p. 191.

[22] W. T. Sherman, *Memoirs of General W. T. Sherman,* (New York, 1891), Vol. I., pp. 273, 274.

[23] *Ibid,* Vol. I, p. 315.

[24] G. O. No. 124, Headquarters, Department of the Cumberland, May 31, 1863.

[25] *Ibid,* (G. O. 124).

[26] G. O. No. 135, Headquarters, Department of the Cumberland, June 7, 1863.

CARDED

This article reprinted from "Hell on Wheels" through the courtesy of the PIO, 2d Armd. Div.

Second Armored Division drivers operating the M59 in the field found that bugs, dust and grime were more than a nuisance. Speed was often decreased below capabilities because the drivers could not see clearly. They went to work on the problem and came up with . . .

A WINDSHIELD FOR THE M59 ARMORED PERSONNEL CARRIER

THE M59 is an excellent vehicle. It is durable, powerful and amphibious. Its occupants are comforted by the knowledge of the armor plate between themselves and the enemy. A .50 caliber machine gun provides firepower. A huge door provides easy exit. But . . . blinded, coughing drivers operating in the field find bugs, dust and grime more than a nuisance. Speed is often decreased far below capabilities because the drivers cannot see clearly.

Several solutions were considered, but the Second Armored Division's 17th Armored Engineer Battalion called upon Captain John T. Kennedy, Company Commander of C Company, to work out the answer.

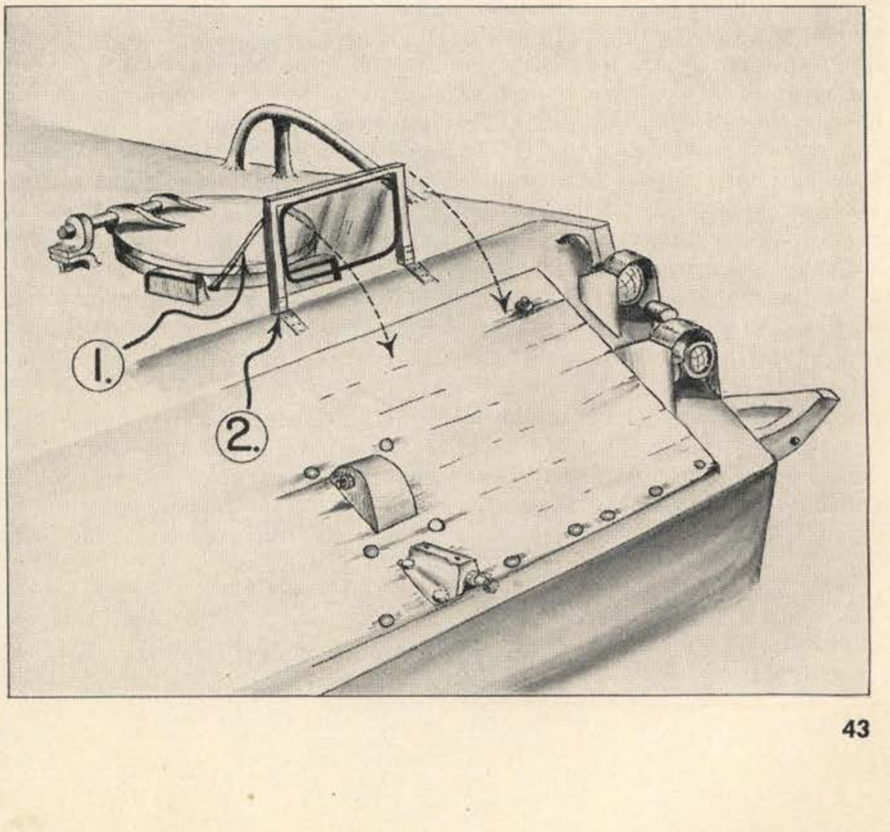
Goggles were considered, but did not adequately solve the problem of keeping the eyes, nose and throat clear of dust. A little bit of salvage material, 15 cents worth of hinges and ingenuity provided a folding windshield for the otherwise perfect armored vehicle.

Captain Kennedy first discovered the need for such a device shortly after the M59s were received in the Battalion. Support missions at the huge Baumholder training grounds left tracked vehicle operators almost asphixiated from the unwanted clouds of dust. Keeping the idea in the back of his mind, the Captain just recently arrived at the solution.

Sp3 Anthony Clatch and Sp3 Eddy Lee, C Company mechanics, drew the assignment of working the idea into a reality. The feasibility of plexiglass was tried, but this idea was discarded when the Air Force informed them that there were no unservicable canopies for the Engineers.

In a last ditch attempt, a worn out defroster provided the necessary glass and scrap channel iron was skillfully welded to make the carrier. Hinges attach the device to the hull and a wing nut on the hatch holds the shield in position. *See one and two on the drawing.* Since the device is only spot welded a cold chisel and hammer are all that are needed to remove it.

Tactical situations requiring complete camouflage discipline are taken into account. The windshield folds neatly against the vehicle, under the splash board. Possibilities of using a good defroster and connecting it to the vehicle electrical system are being considered. This would make the device useful for all possible weather conditions.



THE FRENCH INTERVENTION IN SOUTHERN RUSSIA

By BENSON LEE GRAYSON

ON November 7, 1917, the Russian Provisional Government of Alexander Kerensky was overthrown by a revolution of the Petrograd Bolsheviks. The new Soviet Government, ignoring commitments which the preceding regime had made to the Allies to remain in the war, began negotiations with Germany for an immediate and separate peace. To Great Britain and France, Russia's withdrawal from the war meant the release of over one hundred German divisions for use on the Western Front. Faced with this imminent disaster, leaders of the two Allied Governments met in Paris to discuss the matter.

The situation in Russia was not entirely unfavorable to the Allies. Although the Bolsheviks had quickly consolidated their control over central Russia, the future of the peripheral areas of the Russian Empire remained uncertain. On the day of the Bolshevik seizure of power, the Don Cossacks declared their intention to resist the Soviet Government. Many of the officers of the Imperial Army fled to Southern Russia, where they began the formation of an anti-Bolshevik volunteer army, under the protection of the Don Cossacks.

The most powerful center of opposition to the Soviets, was in the Ukraine. A large part of the population had become influenced by Ukrainian nationalism, which could be used as a weapon against the Russian Bolsheviks. The concentration of raw materials and heavy industry in the Ukraine gave promise that an independent Ukranian Nation would be economically viable. Thus, in mid-November of 1917, the French Government offered to support the newly established Ukranian Republic.

The Ukranian Rada (Parliament) was uncertain as to the desirablity of French assistance. It realized that France was primarily interested in having the Ukraine continue the war against Germany. Although the Rada desired French help in opposing the Russian Bolsheviks, it wanted an end to the war with Germany even more.

Meanwhile, the leaders of the French and British Governments were meeting in Paris to discuss the Russian problem. Their plan for Allied intervention in Russia was never carried out. The Ukranian Government signed a peace treaty with Germany on February 8, 1918, ending Allied hopes for a continuation of the Eastern Front. Bolshevik military action forced the Don Cossacks to terminate hostilities, and on March 3, 1918, the Soviet Government signed the peace treaty of Brest-Litovsk with Germany. As a result, the plans for Allied intervention in the Ukraine and Southern Russia were postponed until a more favorable opportunity should occur.

Throughout the Spring and Summer months, Allied efforts were directed towards defeating Germany on the Western Front, and little attention could be spared for the situation in Russia. Following the German capitulation in November, the French Government resumed its participation in Russian affairs. Consultations with Great Britain resulted in the decision to send military forces of the two nations to the areas determined by the agreement of December 23, 1917. This agreement, which had been made for the purpose of supporting any Russian elements opposing Germany, was thus transformed into a vehicle for Allied operations against the Bolsheviks.

The reasons for the French intervention in Russia were varied and extremely complex. Continued Bolshevik control of Russia made obsolete the prewar strategy of relying upon a strong, friendly Russia as an ally against Germany. The defeat of the Bolsheviks and the establishment of a democratic government in Russia would, therefore, ensure French security. In addition, the Bolsheviks were threatening to overrun central Europe, and it was reasonable to defend French military intervention in Russia.

There were humanitarian reasons for the French intervention. When the Allies had attempted to keep Russia in the war in November 1917, many anti-Soviet Russians revealed their opposition to the Bolsheviks by accepting Western support. The French Government felt morally obligated to protect them from Bolshevik revenge.

The third factor determining intervention, which has been featured in Soviet propaganda to the exclusion of the other two, was the widespread French financial interest in Russia. The action of the Bolsheviks in nationalizing foreign-owned industry and repudiating the Tsarist war debts had caused French investors vast losses.

On November 26, 1918, powerful units of the French and British fleet entered the Black Sea and anchored off the Russian naval base of Sevastopol in the Crimea. The vessels of the Soviet Black Sea Fleet were captured with no opposition, and the Allied fleet proceeded to the city of Odessa, where it anchored for three weeks to await the arrival of transports carrying the French army of occupation.

The vanguard of the French force arrived on December 17th, under the command of General Borius. Protected by the guns of the Allied fleet, the General landed in Odessa and made a personal reconnaissance of the situation. He found conditions in Odessa completely confused. Shortly before the arrival of the Allied fleet, the

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2d LIEUTENANT BENSON LEE GRAYSON, USAR, a contributor to *ARMOR* is attending school in NYC, he is studying for his Doctorate.

representative of the Allied Powers in the Ukraine, Emile Henno, had established his headquarters in the city. Finding a unit of the Russian volunteer army stationed in Odessa, he made contact with them, and obtained their cooperation in preparing for the arrival of the French expeditionary force.

This agreement remained in force until December 17, when word reached Odessa that an army of the independent Ukranian Government was advancing upon the city. Although both the Ukranians and Russian volunteers were violently anti-communist, they hated each other as much as they did the Bolsheviks. In order to prevent bloodshed between the two forces, Henno persuaded both factions to agree to a joint occupation of Odessa.

This was the situation on December 18 when General Borius landed in Odessa. His orders were vague, instructing him to "work with the Russian patriots" without specifying who the patriots were.

The disembarkation of the French troops began on December 19. The operation was proceeding according to plan, when the Russian volunteers suddenly attacked the Ukranian force. The French soldiers, having no orders, stood by and did not intervene. Within a few hours, the Ukranians were driven from the town. Thus, the French intervention was off to a disastrous beginning.

In January 1919, General d'Anselme arrived in Odessa to take command of the expeditionary force. The original landing party of 1800 men was reinforced with 20,000 troops, including some Greek units. The forces under his command, however, were still too weak to oppose the Bolsheviks without support of local troops.

General d'Anselme attempted to end the hostility between Ukranians and Russian volunteers and establish a combined anti-Communist coalition. His efforts to negotiate with both factions at the same time irritated all concerned, and the action of General Borius in appointing the commander of the volunteers to the post of military governor of Odessa led to the complete collapse of the French meditation attempt.

The French intervention received a further setback when an invading Bolshevik army captured the Ukranian capital of Kiev. As the Bolsheviks continued to advance into the Ukraine, French troops were sent to the front to bolster the forces defending the area.

The morale and fighting spirit of the French units in the expeditionary force was very low. The soldiers were veterans of five years of bloody fighting in World War I and wanted so much to be returned to France and discharged. The troops were given inferior rations and were lodged in unsanitary quarters. No provision had been made to furnish them with winter clothing, and when cold weather arrived, their suffering greatly increased.

French military operations were further impeded by sabotage directed by French Communists, both in France and in Odessa. The members of the expeditionary force were showered with handbills asking them to refuse to fight their "fellow workmen." On March 1, 1919, Russian volunteer counter-intelligence agents discovered the existence of an underground terrorist organization in Odessa. Several French sailors were implicated and they confessed to accepting money to murder General d'Anselme. Those involved in the plot were immediately court-martialed, and eleven of the leaders were secretly executed.

The knowledge that their forces were being subverted by the advancing Bolsheviks could not help but undermine the confidence of the French military leaders. Soon they were given concrete evidence of the complete disintegration of the expeditionary force. On March 7, two companies of the 176th infantry openly defied the orders of their officers to defend the city of Kherson. General d'Anselme contented himself with withdrawing the disaffected unit from the Ukraine and dispatching them to French Africa.

In France, meanwhile, the political parties of the left united in urging the withdrawal of the expeditionary force. By the end of March, opposition to the intervention had grown so strong in the French Chamber of Deputies that the Under-Secretary of War was forced to declare that no further troops would be dispatched to Russia, nor would replacements be sent to take the place of those demobilized.

If no additional soldiers could be sent, it was at least possible for the French Government to send another general. On March 27, General Franchet d'Esperey arrived in Odessa under orders to determine whether it was feasible for the French forces to defend the city from the Bolsheviks. He concluded that the Ukranian Government had lost the support of the population. Although the Russian volunteer army was capable of resisting the Bolsheviks for an extended period of time, d'Esperey felt that it had come to be regarded as an agent of the Tsarist aristocracy.

He, therefore, reported to the French Government that it would be possible for the expeditionary force to defend the city of Odessa successfully, because of Allied naval superiority in the Black Sea. The rest of the Ukraine, however, could not be denied the Bolsheviks without considerable French reinforcement.

On April 2, 1919, word spread throughout Odessa that the French were planning to evacuate the city. Immediately, Bolsheviks among the civilian population began preparations to prevent a successful withdrawal. On the following day, a delegation of workers visited General d'Anselme and warned him that they were prepared to oppose the evacuation. As their price for not attacking the expeditionary force, they demanded the surrender of the Russian volunteer troops. The French general refused, answering that any uprising in Odessa would be met by a bombardment from the Allied fleet covering the withdrawal.

Faced with seeing their city reduced to rubble, the delegation agreed to permit the embarkation of all those who wished to leave Odessa. The evacuation began on April 4, and despite a general strike by the workers of the city, all forces were successfully embarked. Two days later, the last French transport left Odessa, protected by the guns of the Allied fleet. The French attempt to intervene in South Russia was over.

The reasons for the failure of the intervention are evident. The various anti-Bolshevik elements in the Ukraine were too blind to reconcile their differences and form a united front against the Soviets. Failing to raise sufficient local troops, France was unable to provide an expeditionary force strong enough to act independently of the various factions in the Ukraine.

NEWS NOTES

Field Training Exercises for FY 1957

The forecast of major field and command post exercises to be conducted between July 1, 1956 and June 30, 1957 was announced recently by the Department of the Army.

The tentative schedule lists seven field exercises which will involve approximately 84,000 troops and include divisional, mountain, jungle and Arctic orientation type exercises.

Exercise RED ARROW is scheduled to take place during November and December at Fort Leonard Wood, Missouri. Participating in the combined and unit training exercise will be the 1st Infantry Division from Fort Riley, Kansas and other supporting units.

In January-February one regimental combat team of the 82d Airborne Division from Fort Bragg, North Carolina, will be airlifted to Alaska to participate in Exercise NORTHERN LIGHT, a training exercise in Arctic operations.

The 1st Armored Division will take part in Exercise SLEDGE HAMMER at Fort Polk, Louisiana, in February and March. This exercise will feature troop tests of SKY CAV II, engineer assault equipment and aerial resupply of armor in the exploitation phase.

Training exercise RIO SELVA will be conducted by a battalion combat team of the 82d Airborne Division in the Panama Canal Zone in March and April. This exercise will provide field training in jungle operations and reinforcement of the Caribbean Command from the continental United States.

U. S. Army

A forward scout reports back to his squad through the world's smallest combat radio built into his helmet. He talks into a thumbsized microphone that slips under the helmet when not in use. The radio was developed by the Signal Corps Engineering Laboratories. It weighs less than a pound, including batteries. In actual combat he would be safer than most forward observers who carry radios on their shoulders, impeding their movements.

Exercise KING COLE, a command post exercise in the field, is scheduled for April at Fort Polk, Louisiana. Involving approximately 26,000 troops, KING COLE is designed to train staff and participating units in new tactical concepts, organization and techniques adopted by the Army. Participants in this exercise include Headquarters III Corps, Headquarters XVIII Airborne Corps, Headquarters 1st Armored Division, Headquarters of the 1st and 3d Infantry Divisions, Headquarters of the 82d and 101st Airborne Divisions, the 2d Armored Cavalry Regiment, the 2d Logistical Command, and field artillery units including 280mm, Honest John, 8″ howitzer and Corporal. KING COLE will emphasize a free maneuver over great distances.

Exercise INDIAN RIVER will be conducted by the 4th Infantry Division in May at Yakima, Washington, to provide combined and unit training. The 4th Division, now in Europe, will be stationed at Fort Lewis, Washington, by the time the exercise is held.

A training exercise in mountain and cold weather operations, COLD SPOT, will be held at Camp Hale, Colorado. It has already commenced and will continue through next Spring. Involving approximately 3,500 troops over the extended period, it will provide training in mountain operations at high altitudes. Participating will be two battalion combat teams of the 1st Infantry Division and elements of the 77th Special Forces Group.

In addition to the scheduled field exercises, tactical command post exercises will be conducted by the Army headquarters in the continental United States. These exercises are intended to provide training for commanders and staff in tactical, intelligence and logistical operations under assumed conditions of extensive atomic, chemical, biological, radiological and electronic warfare capabilities of both friendly and enemy forces. A logistical command post exercise, LOGEX 57, is scheduled for Fort Lee, Virginia, in May. Participants in LOGEX 57 will be student officers at technical and administrative schools and selected Army Reserve officers.

Fort Myer Dedicates Hall in Memory of General Wainwright

With the renovation of Fort Myer's old Officers' Club complete, dedication ceremonies renaming the building Wainwright Hall in memory of the hero of Corregidor, the late General Jonathan M. Wainwright, were held at Fort Myer, Virginia, on July 9.

The ceremonies were conducted on the lawn outside Wainwright Hall. As renovated the building will include the Colonial Room, formerly the "Old Guard Lounge" and bachelor officers' quarters upstairs along with several suites for visiting dignitaries.

Guest of honor for the occasion was Gen. Wainwright's son, Captain Jonathan M. Wainwright V, U S Merchant Marine. Fort Myer commander, Colonel J. Paul Breden, opened the ceremony followed by an address by Major General Guy V. Henry, USA, Ret. General Henry was post commander at Fort Myer between 1927 and 1930. Relatives and friends of the late general attended the dedication along with many distinguished officers and government officials.

Remotely Controlled Helicopter

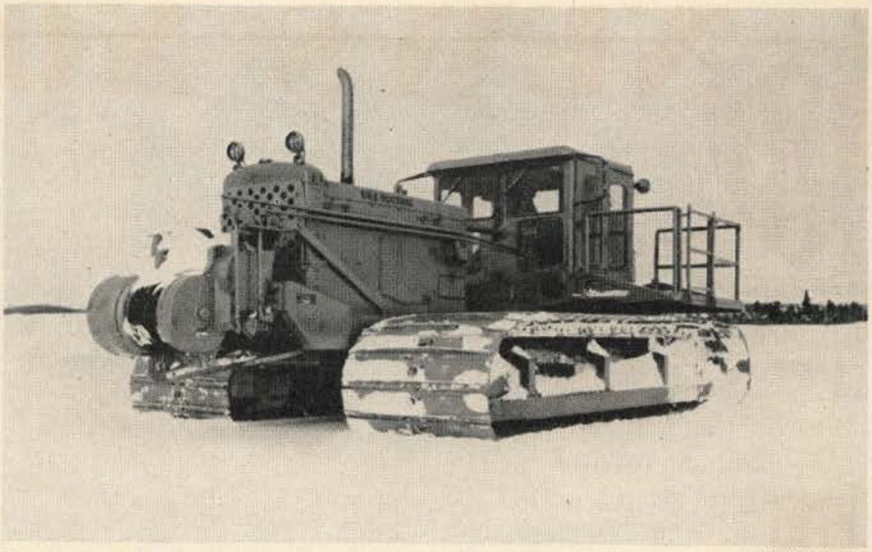
A remotely controlled helicopter which can perform a wide range of military missions has been developed by the Navy, Army and Kaman Aircraft Corporation, Bloomfield, Connecticut, the two services announced recently.

Uses for remotely controlled helicopters could be in battlefield surveillance, where a flying TV camera and transmitter directed from behind the front lines

U. S. Army

Sergeant Russell V. Gross, Co B, 826th Tank Battalion, who distinguished himself as the top United States Army tank gunner in Europe in the last May tank-gunnery tests, receives a 21-jewel wrist watch from the V Corps Chief of Staff, Brigadier General William M. Breckinridge. Presentation was made at the Corps Headquarters in Frankfurt, as the Sergeant's Battalion nd Group Commanders, shown in the background, witness the ceremony.

would give combat commanders a running view of action on the battlefield and movements behind enemy lines. Nor does the versatility of the remotely controlled helicopter end here. It can lay communication wires rapidly over rough terrain, carry cargo and supplies to otherwise inaccessible areas, drop smoke bombs to mark targets for artillery fire, lay smoke screens to obscure troop movements, carry motion picture and still cameras for permanent records of battlefield surveillance, or be used as a highly manueverable vehicle against such land vehicles as tanks. It can even lay a line of explosive charges through an area which has been spotted with enemy land mines and can explode those charges, thereby clearing a path for the movement of troops and vehicles. Thus many dangerous missions can be accomplished without hazard to pilots and other personnel.



U. S. Army

This tractor, which features a unit ground pressure of only 3.4 pounds per square inch, has been developed by the Corps of Engineers' Research and Development Laboratories, Fort Belvoir, Va., to tow heavy payloads in the Arctic. Track "shoes" 54 inches wide make possible the extremely low ground pressure.

Transfer of Army Aviation Training Responsibility

As a result of a Department of Defense approved agreement between the Departments of the Army and Air Force, the Wolters Air Force Base, Mineral Wells, Texas, was transferred from the Air Force to the Army and a similar transfer will be made at the Edward Gary Air Force Base, San Marcos, Texas, on or before January 1, 1957.

Primary fixed-wing pilot training will be conducted at the Gary installation and primary cargo helicopter pilot training at Wolters. Army aviation training at both installations will be conducted by civilian contract. Army aviation tactical fixed wing and advanced cargo helicopter pilot training will continue at the Army Aviation School, Fort Rucker, Alabama.

Top Command Changes

Major General John M. Willems, Commanding General of the 3d Armored Division during its recent Gyroscope move to Germany, was recently transferred to USAREUR Headquarters where he becomes Assistant Chief of Staff G2 for that command.

Major General Robert W. Porter, Jr. moves up from Assistant Division Commander to the Command of the Spearhead Division. Brigadier General James H. Polk, former Division Chief of Staff, moves into the position vacated by General Porter.

Major General Paul A. Disney will assume command of the U. S. Army Training Center, Armor, at Fort Knox in September.

Static Firing Test Stand Completed

The largest static firing test stand for rocket motors in the United States, and possibly the world, has been completed and is ready for use at the Redstone Arsenal, Huntsville, Alabama, the Department of the Army has announced.

The huge test facility, started two and one-half years ago and costing a total of $12,000,000 will be capable of testing the intermediate range ballistic missile now being developed at Redstone Arsenal by the Army Ballistic Missile Agency under command of Major General John B. Medaris. It may also test even more powerful missiles.

Static testing of a missile consists in locking the missile into place on the stand and firing it. The missile does not "take off," but as it strains against the mighty grip of the great tower its roaring engine can be studied for performance characteristics as if it were actually in flight.

Redstone's test stand, built of reinforced concrete, towers 145 feet high—as tall as a 15-story building. Its walls are 48 inches thick. A "basement" for the stand extends 20 feet below the ground and is connected by underground tunnel to an observation and control blockhouse a thousand feet away.

The tower, 30 feet wide and 20 feet deep, is serviced by an elevator, and is equipped with movable steel platforms for servicing the missile being tested.

The test stand itself is only a part of the entire test facility, being surrounded by a complicated layout of other buildings and devices including a boiler plant, a booster water pump station, an engine building, a nitrogen booster station, a guardhouse, a horizontal test stand, a components test laboratory, a cold calibration test stand, a propellant storage area, and a ready storage area.

A huge Gantry crane, with a 90,000-pound capacity, is used to lift the test missiles into place on the stand.

The entire facility is serviced by a network of roads and railroads.

The Strategic Reserve

The future lexicon of the United States Army will reflect the term "Strategic Reserve" rather than "General Reserve" in referring to deployable active Army units located in the United States and the Territory of Hawaii.

The change in terminology is intended to provide a name that more accurately portrays an active force capable of strategic employment and to describe the broad scope of operations for which the units are constituted. The Strategic Reserve is defined as "that part of the Army normally located in the Continental United States and Hawaii which is trained, equipped, and maintained for employment at national level in accordance with current Army plans or approved emergency deployment schedules." The Strategic Reserve is composed of active Army units and does not include Army Reserve or National Guard.

Units of the Army Antiaircraft Command are not included within the Strategic Reserve since these units have different missions and commanders from those of the Strategic Reserve.

Deployable forces in Hawaii will be considered as part of the Strategic Reserve for deployment.

Mechanical Mules Go Into Production

The first of the Army's new "Mechanical Mules" have gone into production under provisions of a contract for approximately $3,500,000 awarded to Willys Motors, Inc.

The contract, which includes approximately $3,000,000 for production and $500,000 for vehicle engineering, calls for first deliveries of the "Mechanical Mules" within a year. Five experimental models were built earlier for rigid test operation.

These "mobile platforms" were designed under supervision of Ordnance Tank-Automotive Command engineers at the Detroit Arsenal for off-road mobility in forward combat areas and for airborne troop operations.

Initial delivery of the "mule" is scheduled for the 101st Airborne Division.

news from THE ARMOR SCHOOL

Armor Training

THERE is a need to emphasize the fact that training is probably one of the most critical functions of the Army today. This statement is based on two major factors. First, the President of the United States has indicated that the Army will soon be a highly trained active nucleus supported by a large pool of reserves in varying stages of training. Second, time is, and will continue to be, a most critical element in the overall training picture. If a future emergency should arise, time to adequately train Armor elements would present a problem.

Consequently, a training program must be developed to answer two basic questions. One, what does the soldier need to know? Specifically, in our case, what does the Armor soldier need to know? Two, how can this essential material be presented most efficiently? Efficient training of course implies efficiency both in time and in the amount of material absorbed by the soldier. A third question that may be considered is how can this material, once learned, be applied by the individual soldier or by units?

With these broad statements as a basis, let us examine the field of training more specifically. Training can be classified into two general areas: production cycle training and post cycle training. Any active unit must be training in one phase or the other; for example, the 3d Armored Division, in training for its recent move to Germany, trained through a production cycle. Most other units in being, however, such as the Armored Cavalry regiments now in Germany, are in the post cycle phase of training.

The production cycle, however, should be examined in detail in any basic discussion of training, since it illustrates very vividly the Army policy of progressive training and the method by which Army training literature supports the training program. The production cycle is divided into three major parts: the activation phase, the training phase and preparation for overseas movement phase. The activation phase of five weeks is subdivided into a cadre training phase and a processing phase. The training phase begins with eight weeks of basic combat training, which provides a common background of fundamental military knowledge for the new soldier. It has the further objective of conditioning every soldier mentally and physically to take his place in combat as an infantryman. During this phase such subjects as rifle marksmanship, military courtesy and first aid are taught.

Advanced individual training of eight weeks is branch material training. We might call it MOS training because in it each soldier is taught to do his job in the Army and to perform the duties necessary for his MOS. One point which must be clarified is that the group of trainees who come out of the basic combat training phase splits into two groups going into the advanced individual phase. One group will become the tactical crewmen of the division-tankers, armored infantrymen and armored artillerymen. During this subphase the tankers would receive such training as tank gunnery, driving and communications. At the same time the specialist in the unit will be receiving schools such as Fort Knox. To counteract a common misconception, basic training includes both basic combat on-the-job training, at battalion or division schools, or at Army service training and advanced individual training. At the end of this period of 16 weeks, the division, theoretically, should be completely trained in the individual phases. However, there is no rigid separation between the advanced individual phase and the next or basic unit phase. There is, in fact, a slight overlap between the two.

The basic unit training phase of ten weeks is training which integrates the individuals into small units such as tank crews, squads, sections, platoons and companies. This phase of the training will consist largely of practical exercises in the field, such as tank platoon in the attack and tank company in the defense. General military subjects, however, are reviewed during this phase.

Advanced unit training of five weeks welds these trained platoons and companies into effective larger units—battalions, combat commands and divisions. Again, this phase consists largely of field problems, the first three weeks being battalion exercises and the last two weeks combat command and division exercises.

This completes the training phase of the production cycle.

Now that the basic framework is laid, we can discuss the methods in which Army training publications can be put to use in the production cycle. The Army Training Program is of course the major training publication to consider during the production cycle. Army Training Programs are complete training programs for units and for individual use. These contain training instructions, training policies, master training schedules, subject scopes and recommended training aids. In order to illustrate the use of the ATP, let us take a tank company through the training phase of the production cycle. During basic combat training the personnel of the tank company are trained through a modified ATP 21-114, which, as mentioned before, is intended to produce a basic infantryman. ATP 17-201 covers both the advanced individual training phase and basic unit training phase for the tank company, a period of 18 weeks. Armor is peculiar in that ATP 17-201 modifies ATP 21-114 by deleting a large group of hours in the latter devoted to individual tactics, then substituting an equal number of hours of subjects more appropriate for Armor, such as driving and maintenance. Like the tank company, each company-sized unit in the Army has an ATP written for it. ATP 17-300 is written for the tank battalion and covers the first three weeks of advanced unit training. This ATP is written in more general terms. It lists the required tactical operations, the number of hours to be taught in each and a very general scope for each subject. The details of operation are left to the commander. A similar ATP, 17-304, covers the last two weeks of advanced unit training, during which combat command training and division exercises are accomplished. The five weeks of field exercise and maneuvers are conducted in accordance with ATP 20-5, which contains training guidance in field exercises and maneuvers for all Army units. Ideally, the division should be moved to a different locale to conduct the field exercises and maneuvers in order to give staffs and commanders an opportunity to work on totally different terrain.

During the entire production cycle, a very definite testing program is accomplished so that the commander can sample his unit's training progress throughout the various phases of training. An individual training test is published by the Department of the Army to be given at the end of basic combat training. At the present time there are no written tests for use during advanced individual training. However, Human Resources Research Office, Unit Number 1, at Fort Knox has developed an Armor Proficiency Test to be given to tank crewmen at the end of advanced individual training. This examination has been tested extensively in Armor units in Germany and was studied and commented on by experienced officers at The Armor School. It is a valid and reliable test for the troop commander's use and should be the forerunner of a series of tests which can be used at the end of the advanced individual training period to test the various types of Armor soldiers.

Department of the Army publishes specific Armor unit training tests for all platoons, companies and battalions to be given at appropriate times during the production cycle. These tests contain a tactical situation which is general in nature. The unit S3 or G3 must write a special situation to fit the particular terrain upon which the test will be run. The test, as published, also includes methods of scoring, reporting, umpire requirements and unit performance requirements. This completes the broad general picture of production cycle with its major supporting publications.

There are, however, several other publications for use by commanders and operations officers in the support of the training programs. One of the most important of these is the Army Subject Schedule. There are two types of subject schedules for Army use: the subject type and the MOS type. The subject type is designed to supplement the ATPs. The ATP, of course, contains master training schedules which list particular subjects, together with the total number of hours required for each subject. The Army Subject Schedule, subject type, breaks down the total hours prescribed for a subject into teachable periods. It also contains the scope, training objectives, uniform and area requirements, lesson outlines and necessary text references for each period.

The subject schedules are a valuable aid for the S3 and the commander in that they will aid the S3 in the preparation of his training schedules and the commander in the preparation of subject material. Also, and most important, the subject schedules tend to standardize training throughout the Army.

Army Subject Schedules, MOS type, on the other hand, are designed to produce a particular crewman or specialist. They correspond very closely to the Programs of Instruction used to train specialists at The Armor Service School. Army Subject Schedules, MOS type, are presently being written for turret mechanics, radio repairmen, communication chiefs and intelligence and operations sergeants.

Finally, a brief word on the future of Armor training. A new section has been established at The Armor School in the General Subjects Department to conduct continuing observation and revision of Armor Army Training Programs, Army Training Tests and allied material. This section, the Training Program and Test Section, is designed to implement the CONARC directive which delegated the production of training programs and training tests to the branch schools. It further answers a need for consolidating in one place all the latest in training thinking and training material. As of today, recommended revisions of all Armor Army ATPs and ATTs have been completed and sent to Headquarters, Continental Army Command, for approval. It is contemplated that revision will be required again beginning this Fall.

Recently there has been developed a very tight bond between technical training research as represented by Human Resources Research Office, Unit Number 1, and tactical experience as is found among the officers at The Armor School. Several specific projects are being planned which should result in basic improvement in training. The first is a project to determine the rate of absorption of basic material by the average trainee; the results of these experimental projects are expected to serve as framework around which advanced individual training programs can be written for all Armor soldiers. If specific times can be developed during which the average soldier can absorb certain basic subjects, this information will tend to make our training programs for the advanced individual training phase as efficient as possible. Such absorption rates will allow the commander to determine easily how much time will be necessary for familiarization or full performance. At the present time the only criteria available is that which has come from varied experiences of a great many officers. It is the welding together of the scientific approach to training research and this wealth of training experience that will enable us to streamline our training programs to fit any particular situation. Another major consideration will be the determination of the usefulness of the practice of "exposing" soldiers to one hour of various subjects in the hope that one or two basic points will possibly be absorbed.

A second project under consideration is to determine testing criteria for Armor units which can be incorporated into Army Training Tests. There are so many variables which arise in testing a unit that it is difficult to determine the relative efficiency of two similar units tested at different times at different places. A solution to the problem of variables in unit testing appears to be to develop reliable valid criteria to correlate exactly with the efficiency or lack of efficiency of a particular type unit—in other words, the development of a "machine records" type test which would require no particular skill or knowledge on the part of the umpires in order to measure the necessary criteria.

Articles in this series to be published in the future will include specific guidance in training techniques, such as a method for developing unit training programs and a method for writing training tests for specific and other related training matters.

If information is desired on Army training procedures or training literature, address inquiries to the Army Training Program and Test Branch, General Subjects Department, The Armor School, Fort Knox, Kentucky.

You Are There—Or Are You?

If you are fully aware of the impact of communication in any given tactical situation, do not bother reading further in this article because it will bore you no end. This article does not contain any new information. As a matter of fact it is an old refrain which has been sung and resung but seemingly never gets hammered home. What is this subject that appears to elude commanders despite frequent repetitions? COMMAND RESPONSIBILITY FOR COMMUNICATION. You have heard it spoken a thousand times, you have seen it written as often, but do you really know what it is?

Where are you as a commander? You are in a dozen places, all at the same time. When making a reconnaissance of an attack position or viewing the terrain of tomorrow's battleground, you are also at your command post splicing wire or in your message center enciphering an important message. When studying the tactical situation on your grease-penciled operations map, you are simultaneously in a messenger jeep carrying a status report to higher headquarters. When at division headquarters receiving orders for tomorrow's attack, you are also in a tank on the company perimeter observing radio silence. Are you there? You are if you are executing your responsibilities in communication.

Can you imagine living a week of your life without any form of communication? It would mean no radio, no television or telephones, no magazines or newspapers, and last but not least no visual gestures or conversation. Taking away communication from our normal day-by-day living certainly leaves us with a dismal outlook. In military life, it is even more important and it is mandatory that the responsibility for communication be placed squarely and solely on the shoulders of the commander.

You may not know one letter of the International Morse Code; however, you are responsible for the slightest infraction of procedure on the part of your radio operators. You may not have the least idea of the functions of a coil, yet your communication equipment must be maintained meticulously. You may never have seen the inside of a signal catalogue, but you are responsible for every item of equipment it authorizes. Your responsibility in signal supply varies from a $3500.00 transmitter to a flashlight bulb valued at a few cents.

The Communication Department of The Armor School has compiled a Commander's Communication Check List. *Don't,* I say again, *don't* skim over these check lists. *Read the question*—then answer it as it applies to you.

COMMANDER'S COMMUNICATION CHECK LIST

Operation

1. Does my communication system fit my task organization to accomplish the mission?
2. Do I have enough organic communication equipment to support this operation, or must I request additional equipment?
3. Are my organic and supporting fire support communication systems integrated with my system so that I may control the distribution of fires?
4. Do I utilize as many means of communication as possible in order not to overload one means or depend on one means too much?
5. Do communication procedures and operating instructions within my command conform with current directives?
6. Have I enforced maximum communication security measures consistent with the accomplishment of my mission?
7. Is my communication system integrated with communication systems of higher and lower headquarters and adjacent units?
8. Have my communication advisory specialists visited my attachments and offered their services?

Communication Personnel

9. How many communication personnel are authorized by TOE?
10. Is each specialist qualified in his MOS?
11. Have I taken advantage of available schools to train my communication personnel?
12. Am I training sufficient communication personnel to fill future losses as well as to meet my immediate requirements?
13. Does each radio set have an assigned radio operating team?
14. What is the status of communication personnel in my attachments?

Maintenance

15. Are daily preventive maintenance forms being kept on each major item of signal equipment?
16. Is maintenance of communication equipment competently supervised?
17. What is the status of signal equipment repair?

Signal Supply

18. Are appropriate Technical Manuals, Signal Catalogs, Technical Bulletins, MWOs and Unsatisfactory Equipment Report Forms on hand?
19. Are all entries pertaining to signal equipment entered proply in the property book?
20. Are substitute items of signal equipment entered in the property book?

21. Are component parts listed on the back of property book pages or in separate files?
22. Do I have an adequate follow-up system on signal requisitions?
23. Is unserviceable property being salvaged periodically?
24. Are reports of survey, statements of changes, or combat loss certificates being initiated as soon as loss or damage becomes known?
25. Is the spare parts stock level in accordance with SIG 7 and 8 or other appropriate directives?
26. Do I have any excess signal equipment on hand which should be turned in?

What do many commanders do when they see a check list like this? They scan it momentarily, nod approvingly, and then, because of the technical aspect, or the magnitude of what it implies, they mark in bold red letters "For necessary action and information," neatly place their initials in the upper left-hand corner, and send it on its merry way to the various "IN" boxes of other staff officers. This is precisely the reason why command responsibility for communication is never *hammered* home.

Our only desire is that you as a commander are aware of COMMAND RESPONSIBILITY FOR COMMUNICATION and to get you to treat the problem with the same concern you give all your other problems.

Key Personnel Changes

Colonel Henry C. Newton, Special Assistant to the Assistant Commandant, as well as Director of Instruction, and long an outstanding figure of The Armor School, retired from active service in July as Brigadier General. Colonel J. B. Sullivan was selected as his successor.

Another retirement during the month was Colonel S. W. Benkosky, Commanding Officer of the Student Regiment, who was succeeded by Lt Col J. W. Smothers.

Colonel J. L. Lee, Director of Weapons Department, departed for his new assignment to the New Jersey Reserve Headquarters. Colonel A. D. Poiner, a recent arrival within the school and former commanding officer of the 11th Armored Cavalry Regiment, is the new Director of Weapons Department.

Colonel A. W. Kogstad, Chief of Tactics Division, Command & Staff Department, departed on his new assignment as the PMS&T, Pennsylvania State University.

THE ARMOR SCHOOL HONOR GRADUATES

The following students received top scholastic honors of their classes (listed in order of rank in the class):

Armor Officer Advanced Course Class Nr 1

Capt Sidney Hack, TAS, Fort Knox, Kentucky; Capt Walter C. McSherry, OS Repl Sta, 6021st SU Pers Cen, Fort Lewis. Washington for asg USAFFE; Capt Robert L. Kirwan, OS Repl Sta, Pers Cen, Ft Lewis, Wash, for asg USAFFE.

Associate Armor Officer Advanced Course Nr 2

Capt Francis G. Gosling, 11th Armored Cavalry Regiment.

Armor Radio Maintenance Course Class Nr 9

Sgt William J. Rivers, 118th Infantry Tank Company, SC NG, Chesterfield, South Carolina.

Turret Maintenance Course Nr 7

PFC Richard A. Coleman, 100th Tank Battalion, 1st Armd Div, Ft Polk.

Armor Officer Basic Course Class Nr 5

2d Lt John H. Mahar, 30th Tank Battalion, Fort Knox, Ky.

Armor Automotive Supervision Course Class Nr 4

SF2 Edward H. Jantz, 28th Infantry Regiment, Ft Carson, Colo.

Armor Track Vehicle Maintenance Course Nr 17

Pvt Charles R. Morgan, Co G, 150th Armored Cavalry Regiment.

Armor Advanced NCO Nr 6

MSgt Kenneth L. Hart, 63d Tank Battalion, 1st Infantry Division, Ft Riley, Kans; Armor Leadership Award team: team leader, MSgt William D. St John, 5th Co Stu Regt, 2128-2 Armor Sch, Ft Knox, Ky; team members: SFC Emil L. Borg, Jr., Co A, 29th Armd Inf Bn, 3d Armd Div, Ft Knox, Ky; Sgt Harless E. Cassell, 714th Tk Bn, Ft Benning, Ga; MSgt John Manuel M. Scott, 13th Inf Regt, Ft Carson, Colo.
Walters, Hq & Hq Co, 2d Bn, 108th ACR, Philadelphia, Miss; MSgt Manuel M. Scott, 13th Inf Regt, Ft Carson, Colo.

Armor Track Vehicle Maintenance Course Class Nr 18

Pvt Stephen J. Molnar, OS Repl Sta, 1264th SU, Ft Dix, New Jersey.

Armor Officer Basic Course Class Nr 7

Second Lieutenant Jackie F. Robinson, Hq & Hq Co, 11th Armored Cavalry Regiment, Ft Knox, Ky.

Armor Radio Maintenance Course Nr 10

SP3 Thomas L. Ewarte, Hq & Hq & Sve Co, 876th Engineer Aviation Battalion, PA NG, Johnstown, Pa.

Armor Turret Maintenance Course Nr 8

PFC Harold F. Dinmock, 1st Armored Division, Ft Polk, La.

Armor Advanced NCO Course Class Nr 7

MSgt Henry N. McKinney, 29th Inf Regt, Ft Benning, Ga; Armor Leadership Award Team: team leader, SFC Clarence F. Brower, 28th Inf Regt, Ft Carson, Colo; team members: Sgt David L. Alexander, 61st Inf Regt, Ft Carson, Colo; MSgt Robert W. Aman, Co D 195th Tk Bn, Nebr NG O'Neill, Nebr; Sgt Charlie W. Porter Sr, 263d Tk Bn (Co D), SC NG, Myrtle Beach, SC; SFC B. C. Roberts, Co D 156th Tk Bn, Dallas, Texas.

Armor Track Vehicle Maintenance Course Class Nr 19

Pvt James T. Myers, 1264th SU Per Cen, O/S Repl Depot, Ft Dix, N. .J

Honor Graduates Armor Extension Courses

For the Period May-July 1956

2d Lt Joseph C. Giambatista, Jersey City 5, N. J., 20 Series, 95% rating; SFC Dale W. Thompson, Rupert, Idaho, 20 Series, 95% rating; Capt William H. Peck, Great Neck, N. Y., 40 Series, 96% rating; Capt Frank B. Hunter, New York, N. Y., 20 Series, 95% rating.

Reorganization of Extension Courses

THE Army Extension Course System has been reorganized effective 2 July 1956. As a part of this reorganization, numerous changes are taking place in the Extension Course Program of The Armor School. Briefly, these changes are:

1. Elimination of "series-type courses"; *i.e.*, 20, 30, 40 and 50 series.

2. Establishment of two courses, called the *Armor Company Grade Extension Course* (the former 20 and 30 series, combined) and the *Armor Advanced Extension Course* (the former 40 and 50 series, combined), to replace the former series.

3. Establishment of the Nonresident Associate Company Officer Course and the Nonresident Associate Advanced Course.

4. Renumbering of all subcourses to eliminate the familiar 20-1, 30-5, etc., and to number all Armor subcourses serially, commencing with one. The list on the opposite page gives the new number, subcourse title and old number in parentheses.

The changes in subject matter administered by The Armor School are slight and consist only of the addition of 18 subcourses to the Armor Extension Course curriculum to provide a closer parallel with equivalent courses taught by the resident departments. Included in the added courses are several combat command courses to expand the Advanced Extension Course to cover the same scope as the resident course. The method of administering extension courses, credit hours, and, in general, all procedures which directly affect the student are unchanged, including the annual minimum requirement of 30 hours of satisfactorily completed work to remain enrolled.

The Nonresident Associate Courses are an innovation and should prove to be of considerable interest to many officers who are unable to attend The Armor School for an appropriate resident course. These courses will provide equivalent credit for either the Resident Associate Company Officer or the Associate Advanced Course. The student can receive this credit by successfully completing the following three items:

1. The Company Grade or the Advanced Extension Course.

2. A special supplementary extension course curriculum to either of the above.

3. A two-week course of resident instruction at The Armor School.

Upon completion of these courses the student is considered a graduate of The Armor School and receives The Armor School Diploma in addition to the DA Form 152, Extension Course Certificate.

The former special series, "The Armored Cavalry Regiment" and "Supporting Elements of the Armored Division," are redesignated as special extension courses.

Eligibilities for extension courses remain much the same. Anyone in the military service or in the reserve is eligible to take extension courses of The Armor School subject to the following limitations:

1. Enlisted men and warrant officers, in order to be eligible for the Company Grade Extension Course, must have completed the Pre-Commission Extension Course, formerly the 10 series, administered by The Infantry School, Fort Benning, Georgia. Lieutenants will normally be enrolled in the Company Grade Extension Course. Captains and field grade officers will normally be enrolled in the Advanced Extension Course. Lieutenants who have completed the Company Grade Extension Course or the equivalent resident work will be eligible for the Advanced Extension Course.

2. Anyone otherwise eligible, regardless of his rank, may enroll for the special extension courses, "The Armored Cavalry Regiment" and "Supporting Elements of the Armored Division," or for any specific subcourse or specially selected group of subcourses, if his duties require their study. Any student may elect to have any optional subcourses or selected subcourses added to his program at any time.

Grade levels of instruction are the same as in the past, but the new numbering system is now applied:

1. Armor subcourses 1 through 30 (platoon level) are considered appropriate to the grade of 2d lieutenant and are also recommended for senior ROTC cadets.

2. Armor subcourses 31 through 63 (company level) are designed for 1st lieutenants.

3. Armor subcourses 64 through 100 (battalion level) are for captains.

4. Armor subcourses 101 through 123 (combat command and armored cavalry regiment level) are for majors.

DA Form 152, Certificate of Completion, will be issued when an individual completes the Advanced or Company Grade Extension Courses. This eliminates two of the "series" certificates, which affect officer promotions in the National Guard. However, letters certifying completion will be issued by The Armor School as the students complete the grade level groupings of subcourses enumerated above and will be the equivalent for promotion purposes of the former 20 and 40 series certificates. DA Form 152 will also be issued upon completion of the special courses, "The Armored Cavalry Regiment" and "Supporting Elements of the Armored Division."

The following are prerequisites for enrollment in the Nonresident Associate courses:

1. *Company Officer.* Lieutenants who are not graduates of a resident or USAR school Armor Basic or Company Officer Course; officers of higher rank who are similarly qualified but who have recently experienced a branch transfer or who have recently been commissioned, and whose duties will require a basic knowledge of Armor branch at the platoon and company level.

2. *Advanced.* Captains or field grade officers who have credit for a resident or nonresident Armor Officer Basic or Armor Company Officer course, including a USAR school course, and who are not graduates of a resident Armor Officer Advanced or Associate Armor Officer Advanced course; lieutenants who have credit for a resident or nonresident Armor Basic or Company Officer course, including a USAR school course.

Students who are now enrolled in the 20, 30, 40 and 50 series will have their enrollments converted to one of the new extension courses, commensurate with their grade and qualifications. Students enrolled in special series or selected subcourses are unaffected but may elect to convert their enrollments to another program, if eligible. Officer students may elect to enter the appropriate nonresident associate program. In converting, no credit for work previously done will be lost. Students who do not wish to have their enrollments converted may be allowed to finish the series in which they are enrolled. It will be necessary to submit a request to The Armor School to continue the series and receive the series certificate in lieu of continuing the converted program. It will not be necessary to submit additional enrollment forms to convert programs currently in progress.

Exemptions for equivalent resident study at The Armor School and the exchange of credit for extension courses completed at other schools will continue as in the past. However, extension course credit will not be granted for subcourses which have undergone major revision since the student first studied the particular topic, thus keeping the curriculum of any individual as up to date as possible. With the active revision program carried on at this School, this will mean an ever-decreasing exemption list. Final determinations of exemptions for each student will be made by The Armor School.

A revised Armor School Prospectus is being printed and will be distributed through company level as soon as it becomes available. All of the above programs will be outlined in the new prospectus.

SUBCOURSES OF THE ARMOR COMPANY GRADE EXTENSION COURSE

1 (20-18)	Employment of the Reconnaissance Platoon
2 (20- 2)	Training and Methods of Instruction—I
3 (20- 3)	Passage of Obstacles
4 (20- 4)	Tank Gunnery—Direct Fire
5 (New)	Individual Weapons, Marksmanship and Musketry
6 (20- 7)	Mess Management
7 (20- 8)	Combat Training of the Individual Soldier and Patrolling—II
8 (20- 9)	Combat Intelligence—II
9 (20-10)	Supervision of Tactical Wheel Vehicle Operation and Maintenance
10 (20-11)	Troop Movement and Bivouac, Tank Company
11 (20-12)	Communication in the Armor Team
12 (20-14)	Tank Platoon in Combat—I
13 (20-15)	Tank Platoon in Combat—II
14 (20- 1)	Map and Aerial Photograph Reading—II
15 (New)	Techniques of Rifle Fire, Rocket Launcher, Hand and Rifle Grenades, Flame Thrower, Night Vision and Sniperscope
16 (New)	Machine Guns
17 (20-17)	Traffic Control—I (Optional)
18 (20- 6)	Field Engineering (Optional)
19 (20-13)	Signal Communication in the Infantry, Airborne, and Armored Divisions (Optional)
20 (20-16)	Battlefield Maintenance
31 (30- 1)	Personnel Administration—I
32 (30- 2)	Training Management
33 (30- 3)	Terrain Evaluation
34 (30- 4)	Fundamentals of Military Justice—II
35 (30- 5)	Estimate of the Situation and Combat Orders
36 (30- 6)	Combat Supply, Tank Company
37 (30- 7)	Leadership—I
38 (30- 8)	Employment of the Tank Company, Armored Cavalry Reconnaissance Battalion (Optional)
39 (30-10)	Reconnaissance and Security
40 (30-11)	Tank Gunnery—I (Matériel)
41 (30-12)	Tank Gunnery—II (Conduct of Fire)
42 (30-13)	Reinforced Tank and Armored Infantry Companies, Offensive Action
43 (30-14)	Reinforced Tank and Armored Infantry Companies, Defensive Action
44 (30-16)	Tank Company, Infantry Division, Offensive Action
45 (30-17)	Tank Company, Infantry Division, Defensive Action
46 (30-18)	Employment of the Reconnaissance Company
47 (30-19)	Tank Company, Special Operations
48 (30-23)	Company and Organization Supply
49 (New)	Miscellaneous Tactics and Operations—I (Optional)
50 (30-15)	Armored Ordnance Battalion (Optional)
51 (30-22)	Armored Quartermaster Battalion, Armored Division (Optional)
52 (30-21)	Military Police Company, Armored Division (Optional)
53 (30- 9)	Medical Service, Armored Division (Optional)

SUBCOURSES OF THE ARMOR ADVANCED EXTENSION COURSE

64 (40-15)	The Tank Battalion of the Infantry Division in the Attack
65 (40- 2)	Rules of Land Warfare
66 (40- 3)	Military Government
67 (40- 4)	Communication in the Tank Battalion
68 (40- 5)	Troop Movement and Bivouac, Tank Battalion
69 (40- 6)	Combat Intelligence—III
70 (40- 7)	Staff Functions, Tank Battalion
71 (40- 8)	Supply, Evacuation, and Trains, Armored Units
72 (40- 9)	Air-Ground Operations for Armor
73 (40-10)	Reinforced Tank and Armored Infantry Battalions, Offensive Action
74 (40-11)	Reinforced Tank and Armored Infantry Battalions, Defensive Action
75 (40-12)	Employment of Army Aviation
76 (40-13)	Traffic Control, Reconnaissance and Planning
77 (40-14)	Field Artillery in Support of Armored Units
78 (40- 1)	Map and Aerial Photograph Reading—III
79 (40-16)	The Tank Battalion of the Infantry Division in the Defense
80 (40-17)	Armored Engineer Battalion
81 (40-18)	Reconnaissance Battalion
82 (40-19)	Automotive Maintenance
83 (40-20)	Radiological Defense
84 (40-21)	Leadership—II
85 (40-22)	Personnel Management—I (Optional)
86 (40-24)	Employment of the Howitzer Company, Reconnaissance Battalion, the Armored Cavalry Regiment (Optional)
87 (New)	Chemical, Biological, and Radiological Warfare
88 (40-25)	Safeguarding of Defense Information (Optional)
89 (40-26)	Organization and Utilization of the Air Force and Navy (Optional)
90 (New)	Infantry/Airborne Operations, General
101 (20- 5)	The Armored Cavalry Regiment
102 (40-23)	Communication in the Armored Cavalry Regiment
103 (50-14)	Employment of the Armored Cavalry Regiment in Security Missions
104 (50-15)	Employment of the Armored Cavalry Regiment in Reconnaissance and Counterreconnaissance Missions
105 (50-16)	Employment of the Armored Cavalry Regiment in Offensive and Defensive Missions
106 (50-17)	Employment of the Armored Cavalry Regiment in Retrograde Movements
107 (50- 1)	Staff Functions, Combat Command
108 (50- 2)	Combat Command in Attack
109 (New)	Combat Command, Offensive Operations
110 (50- 4)	Combat Command in Exploitation
111 (50- 5)	Amphibious Operations
112 (New)	Combat Command, Armored Marches
113 (New)	Combat Command, Penetration
114 (New)	Combat Command, Pursuit
115 (New)	Combat Command in Defensive Operations
116 (New)	Combat Command in Retrograde Operations
117 (New)	Logistics, Armored Units
118 (New)	Communication in the Combat Command
119 (New)	Introduction to Psychological Warfare (Optional)
120 (New)	Personnel Management—II (Optional)
121 (New)	Guided Missiles—General (Optional)
122 (New)	Field Artillery In the Offense and Defense (Optional)
123 (New)	Movement by Air—I (Optional)

FROM THESE PAGES

65 Years Ago

A "regular army" is doubtless, at first, and for some time, superior to a "raw levy." But the "raw levy" does not remain so forever; and, when somewhat drilled and disciplined, such a force has scored more than one victory over regulars. If in addition, the levy was originally made up mostly of men, intelligent, educated, excellent shots, and animated by the belief that they are fighting for principles admitting of no choice between success and ruin, no good reason can be perceived why such troop should stand in any special dread of regular troops, and history shows us that the former have often prevailed. And when, in addition, the "raw levy" has had the experience of several years of actual campaigning and fighting, we confess ourselves unable to understand why such a force should not be superior to any regular army secured under ordinary conditions, because it was composed of better material in the first place and had been trained in "the best of all schools"—and this exactly describes the American troops.

This point our critic will never concede, whether as a general principle or as applying to the Civil War; refusing to be convinced by either Americans or Europeans; and apparently refusing to credit or to consider historical truths with which he is doubtless acquainted.

In all our eminent critic's writings upon this subject, there probably is no point so frequently mentioned, nor so persistently urged as his opinion that our armies were "very imperfectly drilled and undisciplined," an idea which appears in some form, on every page.

LIEUTENANT WILLIAM A. SHUNK

Foreign Criticism of the Civil War

25 Years Ago

It is believed that the doctrine taught now in the American Cavalry is essentially correct. It includes both mounted and dismounted action. It insists upon deployment, laterally and in depth, for both types of action. It demands great firepower within all Cavalry units, not only for defense but also to support the advance of both mounted and dismounted riflemen. It requires that all riflemen be trained to advance dismounted to the attack without undue exposure; that is, by stealthy approach and skillful utilization of cover afforded by accidents of the ground, no firing positions established or any exposure permitted for this purpose until within two or three hundred yards of the enemy's position; no halting on open or exposed ground; fire support by machine guns, and artillery if available, to be constant and powerful until the riflemen take up the firing themselves at very close ranges. It requires leadership of a very high order by platoon and squad leaders in both mounted and dismounted action. It requires an armament and training for protection against observation or attack by hostile aircraft or hostile mechanized force. It specifies that the various roles of Cavalry are much the same as heretofore but that the paramount role is to support the Infantry by attacking at the critical moment at the sensitive spot in the enemy's organization or against his reserves. It requires that a skillful and uniform method of marching shall prevail as one of the great essentials in Cavalry training and operations. And, lastly, it requires bold and skillful riding across all kinds of country.

BRIGADIER GENERAL HAMILTON S. HAWKINS

Cavalry and Mechanized Force

50 Years Ago

In larger actions fire control by officers is gradually lost as the distance between combatants decreases; and the soldier at approximately 800 yards, if not sooner, is deprived of the support and control of his superiors just at the time when he stands most in need of direction and encouragement. Who at this critical period is the best soldier? Who at this time will display the greatest coolness, the most self reliance, the greatest aggressiveness? It is the soldier who has confidence in himself; the soldier who, despising the poor marksmanship of his antagonist, keeps his head and makes his fire tell. It is the soldier who knows that he can hit what he shoots at.

There is no need to emphasize the importance of good shooting. Its necessity is such that it appeals to the intelligence of every thinking officer. In garrison, in time of peace, this qualification is lost sight of to some degree, but in action it looms gigantic, overshadowing every other requisite. The ability of the soldier to shoot well is vital to the success of an army in battle.

Years ago, when hardy spirits first populated our Western wilds, every man was a sharpshooter, and even the women were accustomed to the use of the rifle. Conditions were responsible for and made necessary this proficiency in arms. And conditions today are equally responsible for the ignorance of the great mass of the American people in this respect.

LIEUTENANT C. A. BACH

Better Marksmanship

10 Years Ago

If one disregards the initial gains made by the Germans in the Summer and Autumn of 1941, when the Red Army was still raw and inexperienced, one must recognize that the chief feature of the Russian forces was an ability for dogged defense in the face of overwhelming odds. The loss of Kiev was not to be repeated, and in 1942 Voronezh and Stalingrad held out heroically until the Soviet reserves were ready to launch their counteroffensive. In this way the German principle of victory through strategic break-through failed to be realized.

On their part, the Russians concentrated on the tactical employment of armored formations. Local break-throughs were exploited to turn German strongpoints. At Stalingrad, Orsha and Bobruisk, Russian tank columns (with accompanying mechanized infantry and artillery) forced their way through the defenses and then pushed the assault from the rear, while the less mobile elements exerted pressure on the front and contained the German troops. Tactical envelopment by mechanized forces became the main use of Russian armored units in the attack.

In defense both sides employed tanks as improvised pillboxes and to augment the artillery. Tank formations were also widely used as operational reserves, to counter-attack wherever a hostile break-through appeared likely.

CAPTAIN FERGUS N. FITZGERALD

The Russo-German Battles 1941-45

HOW WOULD YOU DO IT?

AN ARMOR SCHOOL PRESENTATION

Situations may arise in combat which require quick, decisive action in order to ensure target destruction. This type of action may prevent the use of normal techniques of target engagement.

FIRST SITUATION

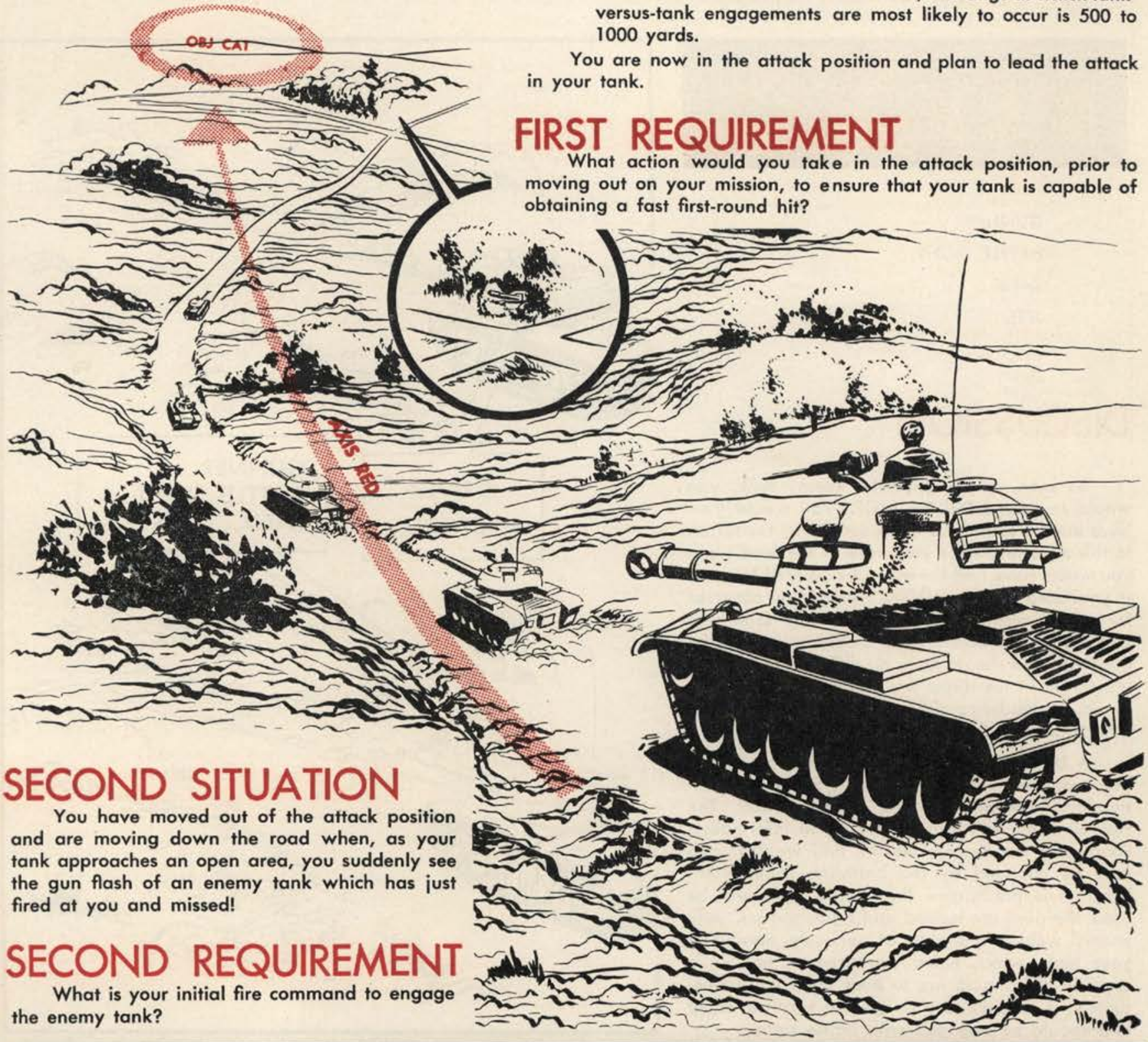
You are the platoon leader of a medium-gun tank platoon (equipped with M48 tanks) in an attack position. The company commander has issued the attack order. Your platoon will lead the company attack along Axis RED to secure Objective CAT. The following information is known to you:

a. The weather is clear, with excellent visibility.
b. The terrain is wooded and affords good defensive positions.
c. The most probable type of target is an enemy tank.
d. Because of the nature of the terrain, the range at which tank-versus-tank engagements are most likely to occur is 500 to 1000 yards.

You are now in the attack position and plan to lead the attack in your tank.

FIRST REQUIREMENT

What action would you take in the attack position, prior to moving out on your mission, to ensure that your tank is capable of obtaining a fast first-round hit?



SECOND SITUATION

You have moved out of the attack position and are moving down the road when, as your tank approaches an open area, you suddenly see the gun flash of an enemy tank which has just fired at you and missed!

SECOND REQUIREMENT

What is your initial fire command to engage the enemy tank?

AUTHOR: MAJ A J MIKETINAC

ILLUSTRATED BY MR J H BAIN

Solution — FIRST REQUIREMENT

Have the gunner index SHOT (or HYPERSHOT) and a range of 800 on the computer. Have the loader load a round of shot ammunition and shift the rounds in the ready racks so that additional shot is readily accessible.

DISCUSSION

Since your tank is to be moving, you and the gunner must constantly be on the alert to spot enemy tanks—which will probably be hidden and will open fire at a comparatively short range. The selection of a round of armor-defeating ammunition is made because the most likely target is a tank. (Hypershot, if available, is better than shot.) The gun is loaded, and additional rounds of shot are more accessible in order to reduce to a minimum the time for loading and reloading. A range of 800 and shot ammunition are indexed into the computer, since this range will give us the best hit probability at ranges up to 1000 yards.

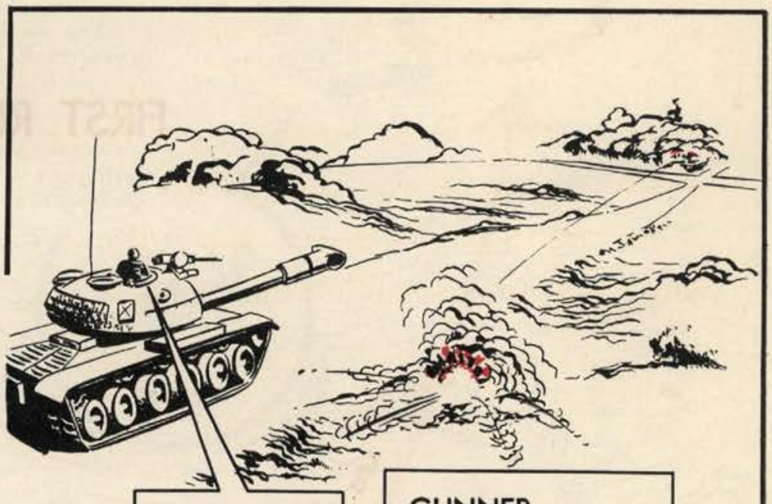
Solution — SECOND REQUIREMENT

GUNNER
BATTLE SIGHT
TANK
FIRE.

DISCUSSION

As soon as you spot the enemy tank, you would command DRIVER STOP. You would then issue the fire command while traversing the turret. In this situation, since you were in the lead tank, you would have had the gun tube pointed forward in your area of responsibility. The gunner observes for targets also; and since the enemy tank was almost to the direct front, he should have seen the gun flash and should have no difficulty in locating the target in his direct fire sights. Without command, the loader continues to load the battle sight ammunition as the gun is fired.

A battle sight is a predetermined range setting combined with a particular type of ammunition, and is usually included in the unit SOP. The two elements will vary according to information concerning the enemy, terrain, and weather and may be changed by the battalion commander. When it is anticipated that battle sight will be used, the guns are loaded and sights are set. Any enemy weapon capable of seriously damaging your tank, which either has fired at you or is capable of bringing fire to bear upon you immediately, is considered a dangerous surprise target and should be engaged with battle sight.


DRIVER STOP!
GUNNER . . BATTLE SIGHT . . . TANK . . . FIRE!

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General Walter Bedell Smith directed the planning for the great designs which gained victory for the Allies. It was his task to bring to the Supreme Commander the plans on which victory hung. But it was General Eisenhower's final and lonely responsibility to determine whether the plans would be accepted.

EISENHOWER'S SIX GREAT DECISIONS: Europe, 1944-45. By General Walter Bedell Smith. 237 pp. Longmans, Green and Company, New York City, New York. $3.95.

Reviewed by BRIGADIER GENERAL HARRY H. SEMMES

Eisenhower's Six Great Decisions is a fascinating book that gives a compact and clear picture of the strategy of the great actions that brought success in Europe. No one but the author, General Walter Bedell Smith, Eisenhower's wartime Chief of Staff, could have so succinctly and lucidly described the great decisions made by the Supreme Commander in Europe which set in motion the momentous battles that resulted in victory. Gen-

The Author

General Walter Bedell Smith, Retired, integrated as a Regular Army officer in 1918, rose through the ranks from Private to General. In addition to a brilliant Army career he served as Ambassador to Moscow, Director of the Central Intelligence Agency and as Undersecretary of State. Resigning from governmental service in 1954 he is Vice Chairman of the American Machinery & Foundry Co. He also wrote *My Three Years in Moscow*.

The Reviewer

Ace photo

Brigadier General Harry H. Semmes, Retired, served in World War I and II. For gallantry in action he has received three Distinguished Service Crosses. Author of the book entitled *Portrait of Patton*, he graduated from Dartmouth College and received his law degree from Georgetown University. He is presently practicing law in Washington, D. C. For many years he has been active on the Council of the United States Armor Association.

eral Smith is to be congratulated for this important contribution to the history of World War II.

The book is comparatively short and should be read by every American, not only because it throws light on the complex but simple art of modern war, but because it illustrates the character of our President, shows his ability to weld into a fighting team such disparate personalities as Patton and Montgomery and shows his honest, humble and truly American approach to international cooperation. Eisenhower's ability to get the best from the great battle leaders of our Allies who contributed arms and men during the holocaust of the war in Europe will stand us in good stead in these perilous times of waging the peace in the post war world.

One of the outstanding features of the Allied operations and one that until this book was written has not been generally appreciated, is that the whole campaign in Europe followed closely the estimates and the original plans made in England before the invasion. There were quick changes and important decisions made during the exigencies of conflict and many of those had much to do with shortening the war and saving the lives of the United States and Allied soldiers. But in general the overall plan followed closely the blueprint made before the channel crossing. It is with those decisions made on the ground and under the tremendous pressures that fall on a Supreme Commander's shoulders that this book is largely concerned.

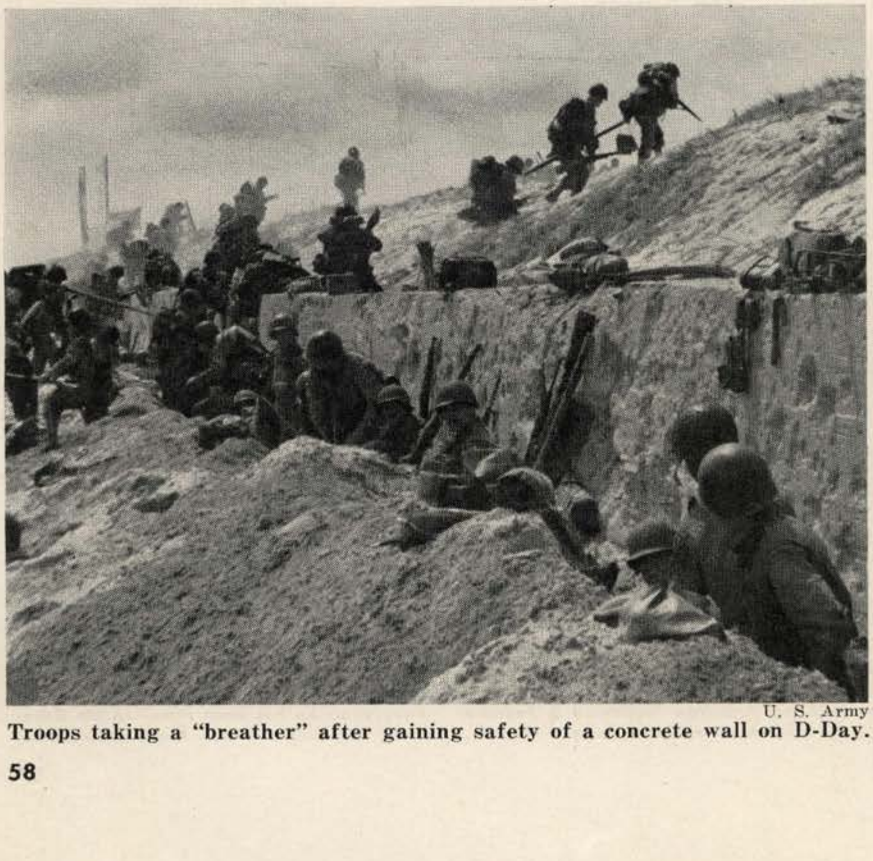
U. S. Army

The first great decision was to pick a day on which to start the invasion.

The first of Eisenhower's great decisions was to pick a day on which to start the invasion of the continent. There were many factors that entered into this selection and one of the worst storms in twenty years in the Channel almost spoiled the plans. It was the Supreme Commander's decision, and his alone, to decide whether or not the landing could be made. There were only a few days in which it was possible to make a landing for there are several factors beside the weather involved. It was necessary that there be a low tide in the morning so that the underwater and half hidden beach obstacles could be destroyed by our demolition crews. The low tide should occur late enough in the morning for an hour's daylight so that the defenses could be submitted to a saturation bombing. Also this low tide had to come early enough in the morning so there would be a second low tide before darkness, because the second low tide was necessary to land the follow-up troops.

Again, we needed a late-rising full moon so that the pilots for the airborne landings could approach their objectives in darkness but have the moonlight for finding their drop zones. Wind, sea and storm were critical factors. The great channel storm that lasted several days before June 6, the date selected, almost forbade landing on that day.

In preparation for making the final


U. S. Army

Troops taking a "breather" after gaining safety of a concrete wall on D-Day.

decision the Supreme Commander had a number of "dry runs" in which he received weather reports so that he could have practice in making the invasion decision. These "dry runs" were held every week, then semiweekly and after the 1st of June, three times a day. . . . "No commander has ever faced a more formidable decision than General Eisenhower at that dawn meeting of his commanders and meteorologists. With the wind blowing rain against the window, it was one man's responsibility to weigh all the factors and decide—twenty-four hours before H-hour on the beaches—whether he would give the order to go."

The pattern of the battle in Normandy produced an opportunity for victory that was decisive and from it ensued quick liberation of all France. The staff of the High Command noticed that Hitler was insisting on an old Prussian principle that "there is only one line in battle and the line must hold." The second great decision of the Supreme Commander was to seize the initiative based on this estimation of the operation of the German Armies and destroy them by aggressive maneuvers which eventually assured the annihilation in the West of Germany's military power. As stated by the author: "This one, in the actual making, comprised little more than a nod of the head, a go-ahead sign to his brilliant lieutenant, Bradley, who had already sketched out in his own mind a plan to take advantage of the glowing opportunity then opening before us. But that nod of the head was the personal assumption of a responsibility that could be assumed by no other. It defied obviously grave risks to secure decisive victory."

U. S. Army

In two weeks Allied spearheads had raced from Normandy to the Siegfried line.

Eisenhower decided that General Patton's spearhead reaching through LeMans would be far to the north at Argentan. The American First Army was turned eastward in a swift movement toward the same town, meeting British forces fighting towards Falaise thus closing giant pincers around the whole German 7th Army. The sweeping results that were brought by this decision were of far reaching importance but the decision was a hazardous one for General Patton's rapid advance left a long unprotected flank to the south. On the flank of the American forces were some 60,000 Germans who might very well threaten the security of the American forces. In discussing this situation with his Corps commander, Wade H. Haislip, Patton made a characteristic decision as described in the book. "General Patton considered this situation for a moment, and then a twinkle came into his eye, 'I'll tell you what you do, Ham,' he said with gravity, 'Just ignore 'em.'"

In summing up the fight in France the author summarizes the situation. "We had won a colossal victory already. General Eisenhower's quick decision to seize the opportunity offered by the Germans had destroyed all resistance in Northwest France. In

U. S. Army

The second decision was to seize the initiative and quickly liberate France.

U. S. Army

German troops exploiting initial success in the Ardennes—Battle of the Bulge.

two weeks our spearheads had raced from Normandy to the Siegfried Line. The invasion of southern France by General Devers' forces on August 15 made such rapid progress up the Rhine Valley that by mid-September our forces were linked from the Channel to the Mediterranean. Hopelessly out-flanked, the remaining German forces in France gave up. Only a few of the ports remained in enemy hands."

The German attack in the Ardennes, which we call the "Battle of the Bulge," caused much more apprehension in the United States than in the staff of the Supreme Commander. The impression should not be given that there was no grave consideration of this violent and desperate attack by the German panzer units. The German command was making an all-out effort to duplicate the initial successes of the war when German Armor plunged through France and took the port of Cherbourg.

Eisenhower's staff knew that there was a large concentration of German Armor in the Ardennes and they estimated that there would be an attack in strength, but they felt that unless there was a breakthrough to the Meuse within a day or two the Germans could not achieve more than local and temporary success. The valiant resistance by the 101st Airborne Division and the relatively green 106th Infantry Division and the 9th Armored Division slowed the advance to about seven miles a day instead of the 50 miles that would have been necessary for a true breakthrough. It was Eisenhower's decision to attack the flanks of the Bulge that eventually crippled the German attack, and these tactics, decided upon the field and while the momentum of the Armor was still under way, that enabled us to destroy the flower of the German Panzer divisions.

"The Ardennes saw some of the bitterest, bloodiest fighting of the entire war in Europe. It called forth deeds of the greatest heroism, and individual courage was routine. There in the snow and the mud, the American soldier proved himself invincible, and his resistance drained Germany dry of her precious reserves. Through all the remaining campaigns leading to the final surrender, the toll of the Ardennes was apparent in Germany's waning military power in the West. It weakened immediately the Nazi forces opposing us West of the Rhine."

Another decision made by Eisenhower resulted in destroying much of the remaining German Army West of the Rhine. The original plan called for the crossing of the Rhine in force at one point but in view of the German disposition to always "hold the line," Eisenhower decided that instead of a holding operation along the front while a main Rhine crossing in the North was developed there would be a succession of coordinated offenses. Because of its determining effect on the remaining battles in the

U. S. Army

Armor troops attacking the flanks of the Bulge to relieve beleaguered Bastogne.

CROSS THE RHINE WITH DRY FEET
COURTESY OF 9th ARMD DIV

U. S. Army

Capturing Remagen bridge had invaluable effects in determining future success.

heart of Germany this plan to fight a course of coordinated battles West of the Rhine was the fourth of the Supreme Commander's six great decisions which sealed the defeat of Hitler in the West.

As a preliminary move, to these coordinated battles West of the Rhine, far to the South General Devers launched his Southern group of armies late in January to eliminate the Colmar pocket. During these battles near the Rhine the famous Remagen crossing was made when a handful of Infantrymen and Engineers rushed across the Ludendorff Bridge before it could be blown. In praise of these American soldiers General Smith says: "They were seasoned to meet death along the roads and in the fields. But here, above the Rhine on a structure loaded with explosives, they faced the almost certain prospect of being blown into the river far below. The bravery of those few men had a decisive effect on the future fortunes of the war. As General Eisenhower said, the bridge at Remagen was 'one of those rare and fleeting opportunities which occasionally occur in war and which, if grasped, have incalculable effects in determining future success.'"

Next, the encirclement of the Ruhr was decided on as that was the supply center of the German Army. Industries in the Ruhr were a prime necessity for the continuing supply of German troops, for it was in the Ruhr that the hardware of war was manufactured for the German armies.

The Germans were now broken forces but there were many units who offered fanatical resistance and it was now the mission of our forces under the Supreme Commander to ferret out all pockets of resistance. Berlin itself was an empty shell and its capture from a military point of view was unimportant. However, the destruction of the German army in its entirety demanded quick mounting of a series of small battles to encircle and capture the strong points and towns still remaining in the hands of German troops. Moreover, it was one of the prime necessities to forbid the concentration of the retreating Germans in the famous National Redoubt located in the vicinity of Berchtesgaden. This was Eisenhower's sixth great decision. The author's description of this last mop-up phase, and the capture of the redoubt fortifications closes the book except for a chapter entitled "Epilogue to Victory" in which the author reviews the campaigns and in particular mentions the intransigence of the Russians.

To sum up, this book, in the short span of a few pages, gives a highly readable picture of the great decisions of World War II. It is true that many other books have appeared containing a great deal more detailed information. But from the standpoint of readability, the author, who had close daily contact with General Eisenhower, has contributed immeasurably, to the literature of that great conflict.

U. S. Army

German forces were broken: The mission—ferret out all pockets of resistance.

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THE UNITED STATES ARMY IN WORLD WAR II

THE TECHNICAL SERVICES

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THE UNITED STATES ARMY IN WORLD WAR II
THE TECHNICAL SERVICES

THE TRANSPORTATION CORPS:

Movements, Training and Supply

by

Chester Wardlow

In a great conflict fought on foreign soil, victory depends on how many soldiers and how much matériel can be moved to the oversea commands and on the timeliness of their arrival. Not until months after the United States entered World War II, however, did the War Department create a unified organization to take over the key role of transportation. A Chief of Transportation was appointed in March 1942, and in the following July of the same year the Transportation Corps came into official existence.

This book makes clear that, in the face of the handicaps involved in setting up a new organization after the war had already begun and making it operate smoothly, the new Corps and its chief achieved an impressive record. Although there were minor transportation delays, some breakdowns in procedures, and some separation of troops and their organization equipment—and the author scrupulously chronicles demerits along with merits—no interruptions in movements to the theaters adversely affected military operations.

Relying on the American inland transportation systems and the merchant marine, with substantial help from British vessels, the Chief of Transportation kept Army troops and matériel flowing smoothly to and through the ports of embarkation, and thence to the theaters. This was a noteworthy feat in view of the heavy losses of ships to enemy submarines, the constant danger of rail and warehouse congestion at the ports, and the extremely close coordination that had to be maintained among the many agencies concerned in training, troops, manufacturing, packing, and storing, and shipping supplies, and providing the means of transportation.

While the movement of troops and matériel was the distinctive function of the Chief of Transportation, he had other exacting responsibilities. Such tasks as training troops to operate ports, railroads, small boats, and amphibious trucks, and to handle other activities in the oversea commands became increasingly heavy as the war progressed. Designing and procuring the many types of small vessels, procuring locomotives and rolling stock for railroads and for lend lease were additional problems. A full account of the transportation job appears in this volume.

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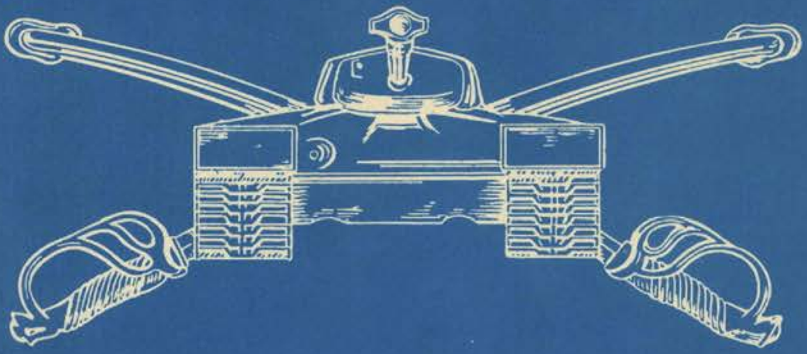

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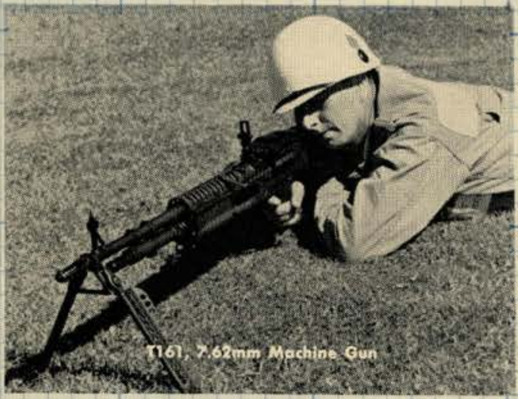
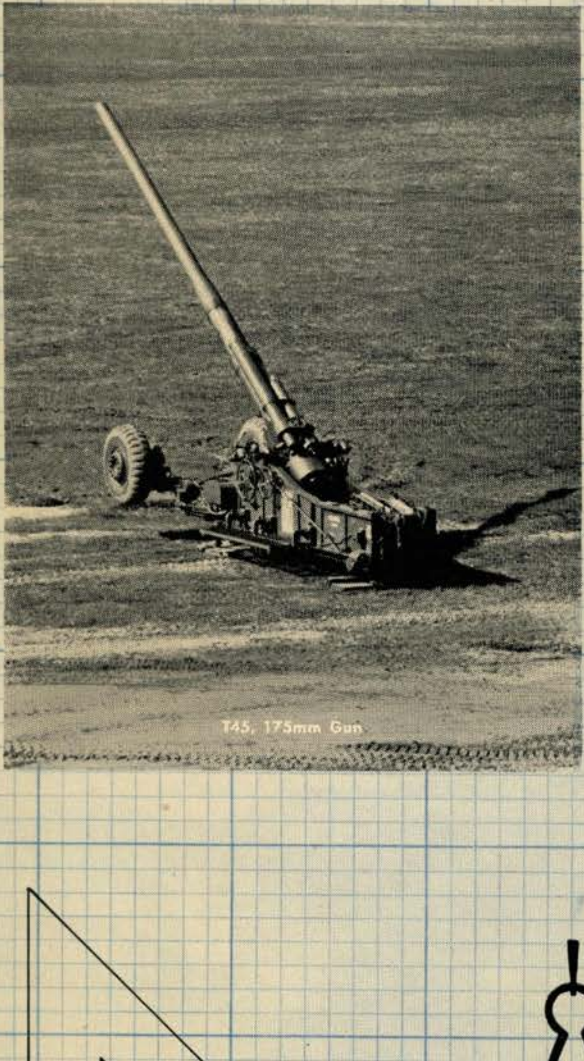
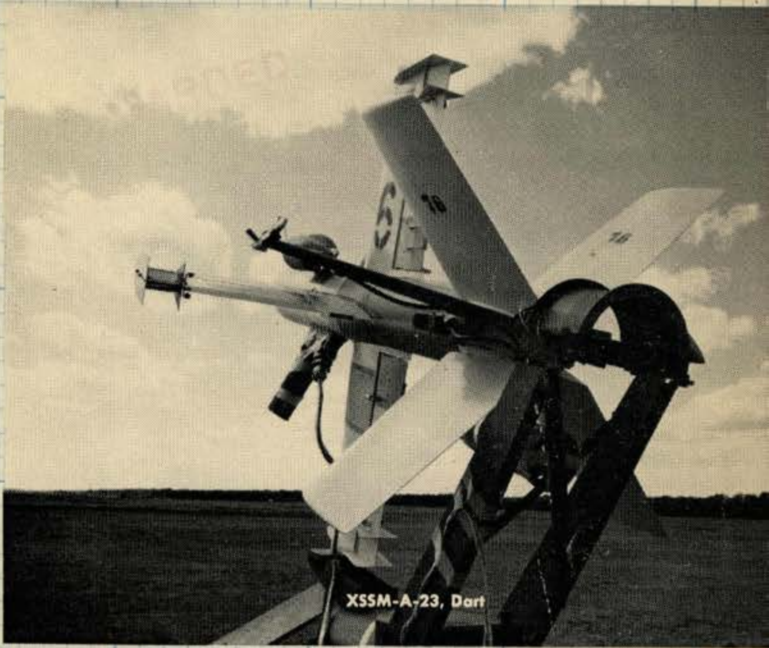


T161, 7.62mm Machine Gun



T45, 175mm Gun



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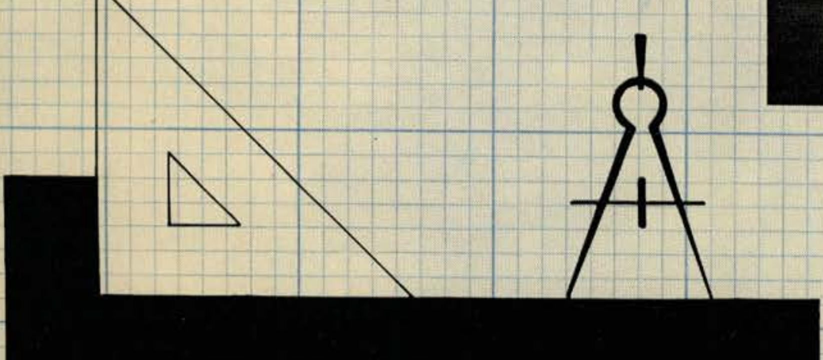

NEW EQUIPMENT . . . . . (See page 36)

NOVEMBER-DECEMBER, 1956 • 85 CENTS

PORK CHOP HILL:
THE AMERICAN FIGHTING MAN IN ACTION
KOREA, SPRING, 1953

by S. L. A. MARSHALL

This well known author has written many fine analytical military books. In this, his latest work, he amassed his material through personal interviews with the patrols before they went into the lines and with the survivors when they came out, resulting in both graphic military history and a deeply moving human document. During WW II he served as Chief Historian for the ETO. In Korea he was the Infantry Operations Analyst for the Eighth Army. In Korea he gathered material for his book THE RIVER AND THE GAUNTLET. At present he is the Military Editor of *The Detroit News.*

The battle on Pork Chop Hill began April 16, 1953 and lasted 48 hours. It was an impressive artillery duel, but Marshall's chief interest and emphasis is always on the men themselves. And he reports action from the point of view of these men, giving their names and companies. Aside from furnishing on-the-spot military information, these reports make the book a deeply moving human document.

The first two-thirds of the book belong to Pork Chop Hill. Marshall traces the record of the various companies who were engaged in the defense of the hill, tells what led up to the battle and what came after. A final section is devoted to the action of six night patrols.

The superb work of the Ethiopians . . . the leadership of individuals in the field . . . mass execution . . . the hero who cracked and vanished . . . the enemy himself—these are the elements of Marshall's work. All of the grim fighting took place against the background of a Korean Spring.

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THIS STUNNING ACCOUNT OF MILITARY MEN IN ACTION TO BE REVIEWED IN THE JANUARY-FEBRUARY ISSUE BY

MAJOR RUSSELL A. GUGELER

We are fortunate in getting such an outstanding writer to review this book. You will recognize him as being the author of COMBAT ACTIONS IN KOREA. He also collaborated with three other writers on one of the first volumes of the WW II series entitled Okinawa: The Last Battle.

Carde

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ARMOR

The Magazine of Mobile Warfare

Continuation of THE CAVALRY JOURNAL

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THEORY OF LAND LOCOMOTION

The Mechanics of Vehicle Mobility

by
M. G. Bekker

This work lays the foundation for a new type of applied mechanics by systematizing the accumulated experience of men who have worked closely with automotive problems over the last forty years—engineers, designers, technicians and production men. The result is an integrated theory of land locomotion which will advance land transportation much as aero and hydrodynamics have helped the development of air and sea travel.

The book discusses in detail problems of soil and snow mechanics; size-form relationships as an index of economy; terrain conditions; the process of moving tracks, skis, sleds, toboggans, rigid wheels and pneumatic tires; static and dynamic behavior; dimensional analysis, testing and over-all economy.

$12.50

LETTERS TO THE EDITOR

More on Defense

Dear Sir:

In the July-August issue of ARMOR, General Bolte, in his excellent book review, cited General George Marshall's emphasis on the overriding necessity of focusing attention on the "study of the first six months of the next war," while he was at the Infantry School. Now, more than ever, we must heed his advice. We are doing a lot of thinking about the first six months of an atomic war, although rather unrealistically, so far as the ground forces are concerned. If atomics are used, it is extremely doubtful if the ground troops of either side will be able to accomplish any decisive mission, because of the lack of logistical support and the loss of the production base. Du Picq has amply shown that panic starts in the rear. Our rear is the American public, already conditioned to be scared silly by the threat of being atomized. How many can you get to man the production lines, load the ships or go into *any* area offering an atomic target? Some, but not enough, when the atoms start flying.

We have to focus on the first six months of a war without atoms. It is certain that, initially, we will be on the defensive. How are we going to defend? Most of our thinking is toward the mobile defense, which is well and good. However, anyone who gives indications that he believes in any fixed defensive position is looked upon with suspicion as being "Maginot minded." Everyone knows that the Maginot Line failed because they fixed themselves in it. Actually, the Line itself didn't fail, the Germans made an off guard play and ran for a touchdown because the backfield was not there to stop them. The forces that should have been available as a reserve were North, preparing for a massive attack of their own. It was a prime example of how *not* to defend. On the other hand, the mass slaughters of the abortive attacks by both sides prior to the advent of the tank in World War I are prime examples of *how* to defend. (Read *Eyewitness*, by Swinton, who can be called the father of the tank.) In one, no provision was made to prevent an exploitation; in the others, both sides so established their defenses and positioned their reserves as to be able to prevent an exploitation.

Let me quote from FM 100-5. Par. 202a, states in part: "Failure to prepare for exploitation may result in a war of attrition, in which the attacker will inevitably suffer heavier losses." (Compare Anzio and Inchon.) Looked at in reverse, a successful defense is one which prevents an exploitation. It is doubtful if an exploitation can occur in these days and times without tanks and trucks, to achieve the speed and the logistic support necessary to maintain the momentum of the exploitation. The main problem of defense, then, is to stop the tanks, thereby preventing exploitation.

What have we got to stop them? Our tanks, of course, BAT's, bazookas, mines, etc. Roughly what the Germans had in 1944 and 45.

But the research people have come up with new developments. Let me again quote from FM 100-5. There is an injunction in par. 9c, speaking of new weapons, that reads as follows: "It is, therefore, of the utmost importance that all officers carefully evaluate every situation, both static and fluid, considering the enhanced capabilities of each opponent as a result of the employment

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Rates: See bottom of contents page.

of the weapons and the limitations on the employment as a result of the availability of the weapons." This injunction has been obeyed in the case of the employment of atomics. However, there are a couple of other new developments which intrigue this writer. They are the Dart and the helicopter. If you don't know about the Dart as a tank killer, you had better find out. Transport them in choppers, and you have enough mobile tank killing force to stop any exploitation in its tracks.

These could be integrated in our defense. A general line of defense, with the tank avenues of approach well covered with fortified defensive positions (islands of resistance), heavily armed with antitank weapons, with the defenders given the mission to hold at all costs. (This mission seems to have gone out of style in our army, although why a soldier cannot be trained to stand and come to close grips with the enemy as well as to advance to close with the enemy to destroy him, I cannot say. Does the attacker naturally have more *Bushido*, perhaps?) Dug in, with a judicious use of concrete, these positions will be hard nuts to crack.

Behind and between the defensive positions, we should have two types of local reserves, or better, reserves capable of forming two types of task forces. One, to operate in tankable avenues, to block, contain and, if possible, destroy enemy forces which have overrun forward positions, or to relieve holding garrisons who might be surrounded and cut off, (quite a normal situation in a fluid defense). The other type of task force must be capable of mopping up infiltrators who succeed in penetrating along non-tankable avenues of approach with the mission of attacking islands of resistance from the rear, destroying artillery, or disrupting communications.

The general reserve need not be particularly large, but it must have mobility and plenty of tank busting power. In these days, mobility means helicopters, and tank busting power means Dart. I suggest special counterattack reserve forces, composed of Infantry with organic Dart units, teamed with Artillery all capable of being helicopter borne. These units, set down in front of any threatened exploitation, will stop it before it can get up any momentum at all.

Using this type of defense, it should take about six months to convince our enemy that it is folly to attack us.

Maybe, by that time, some bright young tanker will have figured out some way to conduct an offensive of our own against an enemy who will, by then, have the same "enhanced capabilities" for defense which we will have so forcibly demonstrated to him.

Colonel Gerard C. Cowan
Det-L-KMAG
APO 102, San Francisco, California

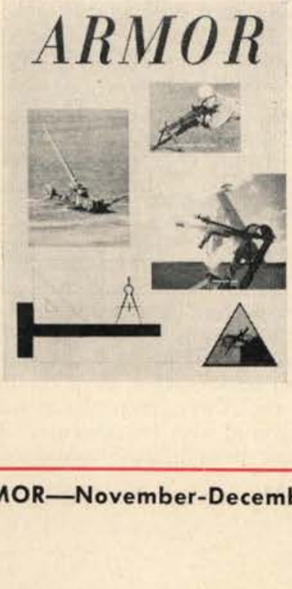
Accentuate the Positive!!!

Dear Sir:

In the July-August issue of *ARMOR* there was a mistake in the article entitled "Defense by Armor."

On page 23, column 1, line 15, the sentence reading "Moreover, the armored division when acting as the corps covering force does not utilize offensive action at every opportunity and in a typical covering force action on a corps front, such opportunities for offensive action are frequent." is in error. During the actual presentation, Lt. Colonel Richmond repeatedly emphasized that the armored division *does* utilize offensive action at every opportunity. The sentence, as it appears in the magazine, does not reflect what was said at the conference. The sentence should have read "Moreover, the armored division when acting as the corps covering force *does* utilize offensive action at every opportunity and in a typical covering force action on a corps front, such opportunities for offensive action are frequent."

Colonel Arthur L. West, Jr.
C&S Department, TAS
Fort Knox, Kentucky



THE COVER

The photographs of new equipment used on the cover of this issue were taken on the occasion of the 38th Annual Meeting of the American Ordnance Association which was held at Aberdeen Proving Ground, Maryland. They are symbolic of the new equipment which stresses greater mobility and firepower.

THE COMPACT
HISTORY
OF THE
UNITED
STATES
ARMY

by

Colonel R. Ernest Dupuy

This is not a book which attempts to tell the story of American military strategy and tactics, skirmishes and battles, or the logistics of war and peace. Instead, here—for the first time—is the story of the United States Army itself: how it began; what it has been; and what it is today. It is the story, too, of American soldiers (and their women and children); of how they lived the Army life; of what they thought and why; of what they did to the Army; and what the Army did to them. Those already in the Service or those who have served in the Army at any time will find in this book a vivid and memorable picture of an important part of their lives.

$4.95

World War II

IN
TORNADO'S
WAKE

by Captain Charles R. Leach

A HISTORY OF THE
8TH ARMORED DIVISION

TO BE REVIEWED IN THE
JANUARY-FEBRUARY ISSUE

ORDER NOW $5.00

In Support of Lesson Plans and an ARMOR Newsletter

Dear Sir:

I read with a great deal of interest Colonel Colwell's letter to the editor concerning lesson plans in the last issue of *ARMOR*. After closely observing several National Guard units for over a year I most heartily agree with Colonel Colwell's suggestion—*Time* is a critical factor. I consider it of the utmost importance to overcome this obstacle as soon as possible if the Army National Guard is going to take its rightful place in the Ready Reserve. Uniformity of both lesson plans and subject material is a worthwhile objective which when added to CONARC's command line of "mandatory" will result in a training impact of desirable proportion. My recommendation is "let's get the ball rolling now on these ATP lesson plans and put some teeth into this program."

I would like to comment on another subject—your announcement that you are going to publish an Armor Newsletter. This is welcome news. It will help bridge the gap between publication months of *ARMOR*. I suggest that you stay in close contact with The Armor School so as to keep personnel in the field informed of FM and TM changes; T/O&E changes; new training films and late changes in doctrine. The letter should be well received and greatly assist us who are not stationed too close to the home of Armor.

LIEUT. COLONEL J. R. DEGENHARDT
Army Advisor, 102 ACR, NJNG
120 Roseville Avenue
Newark, New Jersey

- *The Armor School sent out a letter to all recipients of the Armor School Informational Letter informing them that the newsletter would be published commencing in January 1957 by the United States Armor Association. The letter is printed here for the information of all concerned. It is hoped that this additional service will fill this void. It is also hoped that sufficient additional individuals and units will join our growing membership roster to offset the cost of the newsletter.* ED.

1. The Armor School, in March 1956, discontinued publication of the quarterly periodical "Informational Letter." Discontinuance was in compliance with Department of the Army regulations which preclude service schools from printing and making distribution of this type periodical.

2. Discontinuance of the "Informational Letter" created a void which the United States Armor Association seeks to fill by the publication of a concise, informational-type letter, similar to the aforementioned Armor School publication. This letter will be distributed within the period when the Armor Association's own magazine ARMOR is not circulated. The basic formula for this publication will continue to include items designed to keep personnel abreast of current changes in Armor tactics or doctrine, new developments in Armor and other like news of interest pertinent to active and reserve units or individuals.

3. It is anticipated that this publication will be distributed initially during December or January and each alternate month thereafter.

4. Members of the Armor Association will receive this publication automatically. To those who found the "Informational Letter" of interest and value, and who are not members of the Armor Association, it is recommended that you subscribe to the U. S. Armor Association and receive both ARMOR *and* the "Informational Letter" at a yearly rate of only $4.75 or $8.00 for two years. Unit addressees may subscribe through the unit fund. Make checks payable to ARMOR and mail to: ARMOR Magazine, 1757 K Street, NW, Washington 6, D. C.

FOR THE COMMANDANT:
KIRK E ADAMS
Lt Col, Armor
Assistant Secretary

On Last Issue's Cover

Dear Sir:

The cover on your September-October issue is a great contribution to Armor. I have always felt that a series of photographs depicting the *EVOLUTION OF THE TANK* should be present in every Tank Company Dayroom or along the walls of barracks corridors.

Too often have I met soldiers in Tank Units who have little knowledge of the development of the Tank (I might even go so far as to state that many officers can be included in this group). Generally the Tanker of today is quite familiar with the particular vehicle his unit is presently authorized but he is somewhat lost when he is confronted with a picture of some of yesterday's great tanks.

I am convinced that if we, in Armor, are interested in maintaining that degree of *esprit* which we believe is normally associated with our branch then some of the fact and legend of yesterday's Tanker must be made available to our Tankers of today.

I agree, wholeheartedly, that our training should be geared to the present and the future, but what man cannot profit from the trials and mistakes of the past?

Your September-October issue represents a method by which this program can be implemented. Your cover format is almost perfect for framing and could be used to present the training of today and tomorrow. Now, if you could prepare your back cover to show the Evolution of the Tank, then the history of Armor would also be presented. I believe that, if each issue contained one large picture, with an appropriately placed description, beginning with the first tank and progressing to the modern fighting machine of today, your magazine would be in continuous demand by most branches of the Service and would be a major contribution toward increasing that *esprit* and effectiveness of today's TANKER. Furthermore, it would stimulate interest in our history and would develop the foundation upon which an even greater Army, with high ideals, could be built.

If it is at all possible I would like to purchase a copy of the print used for the September-October cover.

MAJOR ORLANDO E. VITULLO
Test Director, Headquarters
Fort Campbell, Kentucky

- *Many compliments have been received regarding this outstanding cover. This letter is one of many we have received. We are deeply indebted to General I. D. White for sending us this picture. To answer the many requests for prints we have turned the original transparency over to the Army Photographic Agency, Office of the Chief Signal Officer, Department of The Army, Washington 25, D. C. Duplicate 4"x5" transparencies may be purchased from that source at $5.00 each. In ordering this cover shot quote File No. C11246.* ED.

More on our Cover

Dear Sir:

On behalf of the 70th Tank Battalion, officers and men, I wish to express to you our appreciation for the splendid coverage given our organization in *ARMOR*, issue of September-October 1956. The cover photograph is magnificent and already many recipients plan to frame the picture. We are also delighted with the publication of the fine article written by our former executive officer, Major A. G. Hill.

This issue was eagerly awaited and more than fulfilled our expectations. The recognition of our unit by the cover and Major Hill's article has given a most gratifying lift to the *esprit* and morale of an already proud unit. Our sincerest thanks go to you and your staff for a fine publication. Needless to say, we consider this is your finest effort to date.

LIEUT. COLONEL RICHARD R. IRVING
Commanding Officer
Headquarters, 70th Tank Battalion
APO 201, San Francisco, California

- *This letter is deeply appreciated and we are happy that it will assist the morale of this unit. However, we would like to state that the primary reason for publishing this material was to give all our members an insight into the problems that might confront them should they be transferred to that area. We attempted to give equal space to all units in the Far East, Pacific and Alaska. The only deviation we made was the cover, which we feel represents all Armor units west of San Francisco. In our January-February issue we are hoping to focus the entire contents, except the book review, on Germany.* ED.

Anyone Care to Contact Someone from "Down Under"?

Dear Sir:

As I have been in my unit for three and a half years, I have naturally acquired an interest in tanks and tank warfare.

The purpose of this letter is to ask you if it could be arranged to have my name and address placed in your magazine so I can obtain a penfriend.

Hoping that this will be received with consideration.

TROOPER A. G. BULLOCK
Headquarters Squadron,
First Armoured Regiment
Royal Australian Armoured Corps
Puckapunyal, Victoria
Australia

Weight *versus* Firepower

Dear Sir:

I'm afraid that I must disagree with that part of Lt. Col. Carroll McFall's article entitled "What is a Tank" (ARMOR, September-October 1956), that refers to the advantages of the lighter, more mobile vehicle.

The use of high mobility should not be to try and dazzle the enemy gunners with sheer speed and I cannot imagine any tank officer trying it.

As I see it, the principle is this:

A modern tank carries far more armor in front than at the side. Therefore, if a tank is on the enemy's flank, it does not need as much gun power. If it can get nearer, it will need less still. The true function of mobility is to get the tank into such an advantageous position.

This is not so much dependent on high speed, as on the ability to stalk across country. An inconspicuous tank, with a low silhouette, silent running motor, good control response and the reserve power to make use of difficult, and unlikely, country, is hardly a greyhound. As these qualities are best obtained in a small vehicle, more tanks can be provided to swamp the opposition by weight of numbers. This equipment will of course require a better standard of tactics and more initiative, than reliance on superior size and weapon power. High road speed comes into its own when the breakthrough is made to avoid opposition and strike at the soft, vulnerable rear. Patton certainly had smaller, and more mobile, tanks than the Tiger. New methods, such as the British BAT 120mm recoilless gun, or the French wire-guided antitank missiles, could lead to a further reduction in the weight an armored vehicle has to carry.

The stalking approach is already a part of the American tradition. Think of Morgan's Rifles!

From an ex-infantryman, tanker and assault-sapper.

PHILIP BARKER
99, Brentford Road
Kings Heath
Birmingham 14, United Kingdom

Armor Meetings in Heidelberg

Dear Sir:

Armor officers of Headquarters, United States Army, Europe, and Headquarters Area Command are planning a series of dinner parties to be held every three months in the Macogen Club here in Heidelberg.

Organized to keep Armor officers now serving in staff positions abreast of the current developments and future of Armor, the meetings include addresses by outstanding Armor authorities.

The first dinner on October 17 featured as speaker, Major General J. M. Willems, Assistant Chief of Staff, G2, United States Army, Europe.

If anyone is heading this way on either permanent change of station or temporary duty we would appreciate hearing from him and extend to him or them a hearty invitation to meet with us.

MAJOR JAMES W. CAMPBELL
Public Information Division
Headquarters, USAREUR
APO 403, New York, N. Y.

More Awards

Dear Sir:

Enclosed is a check for a one-year membership to *ARMOR*.

This yearly membership is being awarded to an outstanding enlisted man of my company, as chosen by a commitee of Master Sergeants at our Annual Unit Training. He is PFC James H. Curtis of Tulsa, Oklahoma.

CAPTAIN CHARLES W. HESSMER
Hq & Sv Co., 735th Tank Battalion
Tulsa, Oklahoma

And More!

Dear Sir:

Enclosed please find check for four memberships to *ARMOR*.

We in C Company, 111th Reconnaissance Battalion, feel that your magazine is beneficial and informative. Therefore, we are initiating a plan where we will award certificates for outstanding service within our unit. In addition to a certificate, winners will receive a one-year membership to your fine magazine. This year we have four winners. They are:

Sgt. Donald Vincent, Sp. 3 Marvin O. Helwitz, Pvt. Robert Green and Pvt. Bert Peterson.

These Guardsmen have displayed the qualities which will reflect on our entire unit, as your magazine has in its own field.

1ST. LIEUT. HOWARD B. ANDREEN
Company C
111th Reconnaissance Squadron
Inglewood, California

CARDED

IS GUNNERY TRAINING COMPLETE?

IS IT EFFECTIVE?

IS IT CONTINUOUS?

Training which emphasizes the ability to move and c
the ability to shoot, deprives the Armored unit of on

GUNNERY IS NOT

By CAPTAIN JOSEPH L

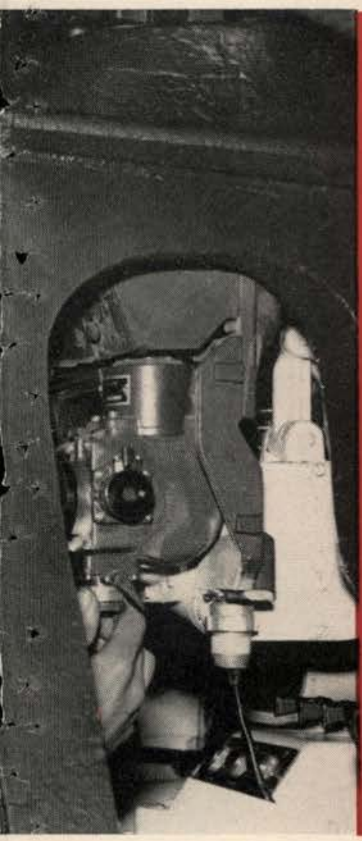
IN Armor, we have a definite need for improving our gunnery training. How many platoon leaders, company commanders, or battalion commanders can truthfully say that their tank crews are *first class;* that they have all-star gunnery material? Unfortunately, all too few unit leaders can make such a claim. Too often we conduct our gunnery phase of training and range firing and then ignore the results. We sometimes go so far as to forget gunnery. Tests have proved that the tank crew is not as proficient and capable in gunnery as it should be. Through their ability to move and communicate, our tank crews are able to go where we direct them. The reason for our creating clouds of dust and cluttering radio channels is normally to enable us to place effective fire on the enemy forces. Move, shoot and communicate; one cannot be divorced from the other, and all must be equally effective. But do they share equal importance and prestige during the major portion of our unit training program? Usually they do not. From crew training to large-scale maneuvers, emphasis is usually placed on the ability to move and communicate —*not* to shoot.

Only an intimate knowledge of the tank turret (armament and controls), of the proper preparation for firing and crew firing duties, and of the principles of conduct of fire give the tank crew the ability to place effective and continuous fire on the enemy with high percentage of rapid first round kills. If tank gunnery is slighted during training, if crew members who miss phases of gunnery training are not given make-up periods, or, if the principles of tank gunnery are not practiced concurrently and continuously with other instruction, the unit cannot possibly be considered well trained and combat ready. Even though it may be able to move with perfection tactically, there is little hope for the unit to do well if it is lacking in the principles of tank gunnery. When the crew is confronted by an enemy tank or antitank gun, their future depends on their ability to shoot. Just as few prize fighters have been victorious because of fancy footwork and nothing

mmunicate, but which places little or no emphasis on
of its most important characteristics—FIREPOWER.

A STEPCHILD

CHMALZEL, JR.



The coordination required between tank commander, gunner and loader must be practiced daily to reach a point of maximum efficiency

U. S. Army

more, few crews have been successful because of fancy tactics and nothing more.

Our unit commanders *must* be certain that our tank gunnery instruction is complete, effective and continuous. Too many commanders wait until the yearly trek to the range is in sight before they consider how complete and effective gunnery instruction has been. Even range work (subcaliber and service firing) may not answer the question because of the variables involved, i.e:

1. Platoon leaders assigned the task of running ranges lose contact with their crews.
2. The scorers or graders must, by necessity, be the unit tank commanders. The written result will reflect the ability of these men.
3. Between the training period spent in garrison and the actual range work, absence and rotation of personnel often cause an uneven level of knowledge.

Unit commanders and S3s are usually prone to complain about the lack of training time and range work given to gunnery but they seldom take advantage of other available hours such as open time, inspections, competitions, related training, and *most important,* field training.

Through imagination and initiative the unit commander can improve upon the ability of his tank crews to deliver effective fire. After following the training schedule prescribed by field manuals, army training programs and unit training memos, he should organize training activities so that the principles of tank gunnery can be applied either concurrently with other training or separately.

Make Gunnery Training continuous—in the billets, at the motor park, on the march, in the assembly area, during the attack.
Include:

- **Off-season firing**
- **Prepare to Fire Checks**
- **Fire Commands and Firing Duties**
- **Adjustment of Fire**
- **Range Determination**
- **Special Situations:**
  - **Range Cards**
  - **Night Firing**
  - **Indirect Fire, etc.**

As a temporary means to determine the degree of proficiency which your tank commanders and gunners have attained, conduct a rigid gunner's preliminary examination—the results may come as a surprise. A more accurate test will result if the battalion officers conduct each phase of the examination. You may be sure that your gunnery instruction was not complete or was not effective if many fail this test.

Off-Season Firing

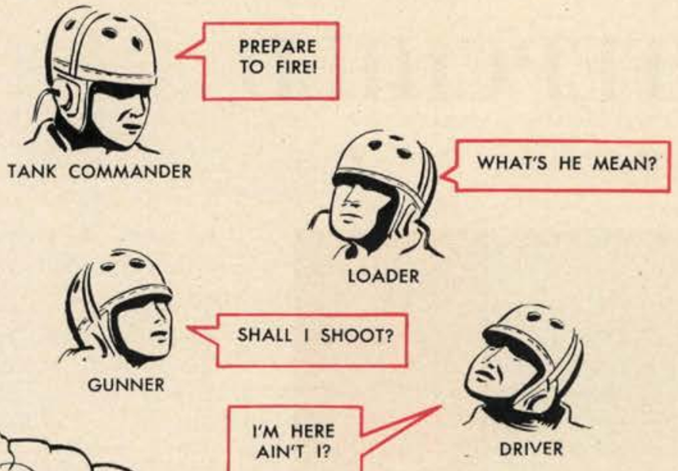
If at all possible, off-season firing should be conducted. (This depends to some extent on range facilities and ammunition allotments; however, the energetic commander and staff can find a way to provide subcaliber ranges and acquire the necessary ammunition.) Some units have fired the tank crew proficiency course on a year-round basis and obtained excellent results. A select crew from each tank company may fire the course in competition with each other, with awards and trophies presented to the winning crew. A four or eight hour period spent in firing one or more of the subcaliber tables is also worth its weight in gold—inexpensive, valuable and *possible!* Tables II, IV, and the newly proposed III require the crew to perform nearly all duties required by service firing.

Prepare to Fire Checks

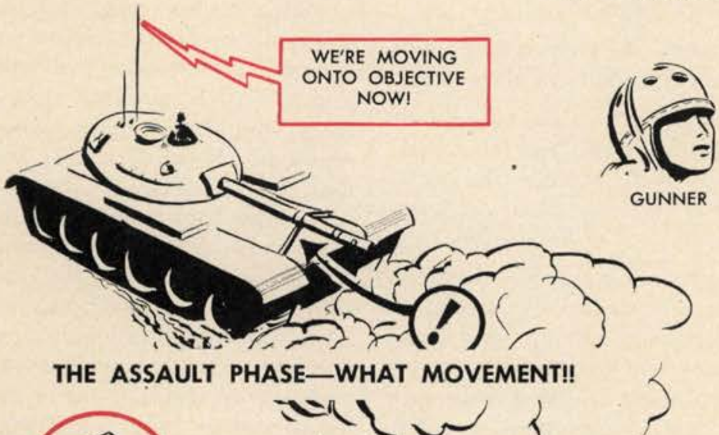
Do we realize the importance of turret maintenance and prepare to fire checks? When an M20 periscope cannot be made to converge with the main gun on a chosen boresight point, it usually means that the gun has never been boresighted properly! If it had been, the fault would have been corrected previously. When a tank commander signals that he is ready to fire and finds that the coaxial machine gun will not fire due to an improperly adjusted solenoid, he has not properly prepared his tank for firing. These procedures and many more are included in an accurate prepare to fire check. After the crews have been taught to perform the prepare to fire check, require the check to be performed frequently—during garrison maintenance periods, on tactical problems in the field, and *always* prior to range or combat firing.

CAPTAIN J. L. SCHMALZEL, JR., Armor, served with the 94th Infantry Division during World War II, graduated from USMA in 1949, and then served with the 14th Armored Cavalry Regiment in Europe. He is now an instructor in tank gunnery at The Armor School, Fort Knox, Kentucky.

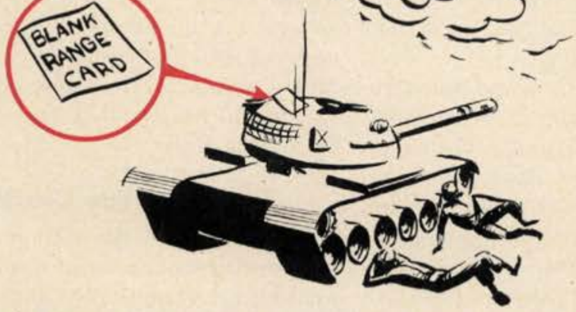
HAVE YOU SEEN UNIT TRAINING CONDUCTED LIKE THIS?


PREPARE TO FIRE!
TANK COMMANDER
WHAT'S HE MEAN?
LOADER
SHALL I SHOOT?
GUNNER
I'M HERE AIN'T I?
DRIVER

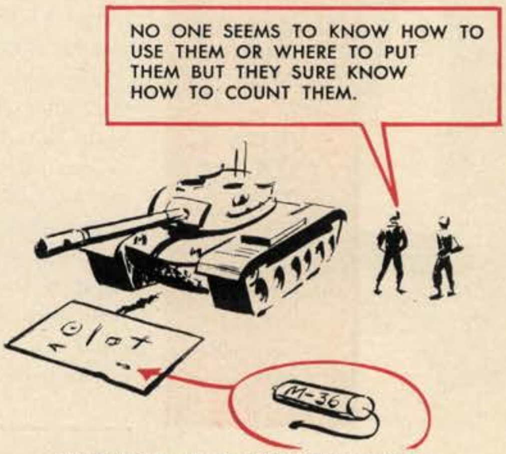
THIS CREW IS WILLING!!


WE'RE MOVING ONTO OBJECTIVE NOW!

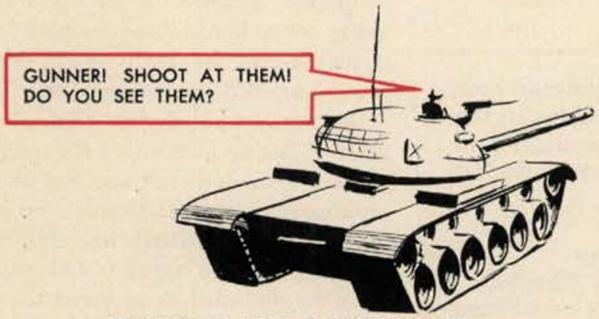
THE ASSAULT PHASE—WHAT MOVEMENT!!


BLANK RANGE CARD

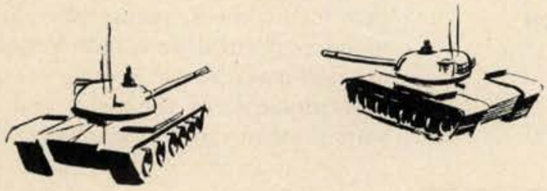
A GOOD DEFENSIVE POSITION—AND READY!!

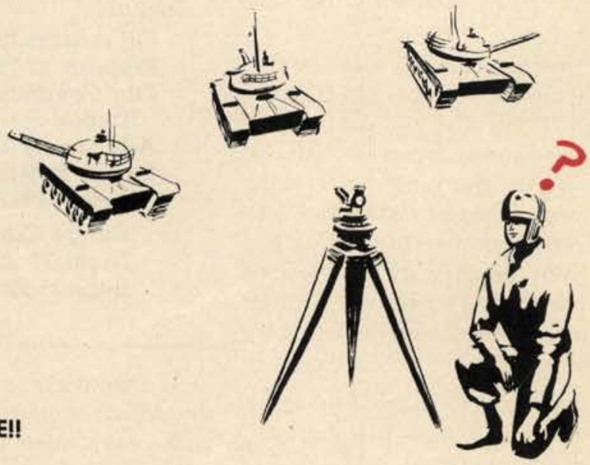

NO ONE SEEMS TO KNOW HOW TO USE THEM OR WHERE TO PUT THEM BUT THEY SURE KNOW HOW TO COUNT THEM.
M-36

PREPARED FOR NIGHT FIRING!!


GUNNER! SHOOT AT THEM! DO YOU SEE THEM?

THIS IS A FIRE COMMAND??





PLAYING THE INDIRECT FIRE ROLE!!

ILLUSTRATION - JACK BAIN

Range Determination

Correct range determination is so vital to accuracy that range determining abilities must be improved and frequently practiced. When range is determined accurately the crew has a much better chance of attaining the goal of tank gunnery—a fast, first round kill. If the tank gun is boresighted and zeroed correctly and the gunner takes the correct sight picture, correct range is the deciding factor. Whether the primary means of determining range is by range finder or estimation by eye, only through practice will the crews maintain their ability to determine range within a prescribed time and unit of error. Contests and qualification courses should be scheduled to develop interest and cause the crew to be cognizant of the importance of range. Some units have placed targets of known range along the routes to their training areas to enable the tank commanders to practice range estimation frequently. A new range finder training device called Trainer Range Finder, Stereoscopic Device 16-D-15, may prove to be a great asset when ranging areas are limited. The ability to range consistently may be developed in the company classroom with this trainer.

There are Armor officers today who do not believe in the stereoscopic range finder. This is usually due to a lack of understanding or an irritation caused by training difficulties. There was a time when people did not believe in steam engines—until they tried to outrun one. The same holds true with our present range finder. It may not be what we ultimately desire, but try to outshoot a tank crew that believes in the M13 and that has been properly trained to use it.

Fire Commands and Crew Firing Duties

The rapidity and accuracy with which a tank crew takes the enemy under fire also depends a great deal on fire commands and crew firing duties—they go hand in hand. The coordination required between tank commander, gunner and loader *must* be practiced daily to reach a point of maximum efficiency. At the beginning of scheduled maintenance periods, tank commanders should be required to conduct several dry firing problems (two or three will keep the memory refreshed). When platoon leaders conduct tactical problems, we should be certain that they include platoon fire commands for area and point targets and that their tank commanders follow up with their own commands.

Appropriate subjects during garrison training:

- **Range Finder Training (turret or trainer).**
- **Target Acquisition Course.**
- **Range Determination Sites.**
- **Adjustment of Fire (conduct of fire trainers).**
- **Turret Exercises (firing duties, preparation to fire checks, etc.)**
- **Aiming Circle.**
- **Indirect Fire Procedures.**
- **Observed Fire Procedure (closely allied w/gunnery subject).**
- **Competitions and Tests in Any and All Subjects.**

Are you in a position where you might command a tank? If so, give yourself the following simple test. You *should* be able to get a hundred!

You are tank commander of an M48 tank and observe an enemy heavy tank moving across your front (left to right) at an unknown range. What is your initial fire command to take the enemy tank under fire? What is the primary method of adjustment? If the gunner announced LOST after firing the first round and you sensed the round as OVER, 3 LEFT, what would be your announced sensing and subsequent fire command?

Adjustment of Fire

Practice in adjustment of direct fire is best accomplished on service or subcaliber ranges. If available, the Tank Gunnery—Conduct of Fire Trainer (DVC-17-4), as noted in DA Pamphlet Nr 310-5, is an excellent garrison means of practicing both the primary and alternate method of adjustment. A crew may sit at the trainer and practice nearly all crew firing duties—commands, sensings, adjustment, etc.

Special Situations

So many Armor officers can relate combat situations where a lack of knowledge of all phases of tank gunnery caused deep embarrassment or even unnecessary casualties. In Italy and Korea there were numerous requests for supporting indirect tank fire; some units could give support immediately while others delayed in order to learn the principles they already should have known.

The preparation and use of range cards, night firing and indirect fire should be reviewed and used whenever possible. Korea taught the tanker to be especially adept at firing during periods of poor visibility and also to be able to support by indirect fire. Before going on field problems inform your tank commanders that range cards will be kept and each critiqued at the conclusion of the exercise. A platoon leader must insist upon well constructed range cards whenever a tank of his unit is in a position which might require one. If the unit is directed to support a simulated action by indirect fire, all procedures *must* be carried out, from laying tanks parallel to simulated fire and adjustments.

Field proficiency tests, military stakes and other types of training tests should place much emphasis on gunnery. Those phases of gunnery which are extremely hard to practice continuously should be included here. The crew's knowledge of tank gunnery principles and their ability to apply these principles should have a real bearing on the unit's rating when inspected or tested by higher headquarters. There is too much emphasis placed on the clean tube and not enough on the use of the tube!

The ideas and examples mentioned are just a beginning when they are compared with the multitude of training methods which are possible. Imagination must be used by us and those above and below us. If we are aggressive and realistic about our tank gunnery instruction and if we make our crews apply these principles whenever possible we can be so *much* surer that it is being effective and complete—so *much* surer than the unit commander who thinks of gunnery only when it is posted on the training schedule or when he is heading for the range.

CARDED

BOARD NUMBER 2, CONARC, EQUIPMENT FOR ARMOR

FOREWORD

By COLONEL JOHN C. WELBORN

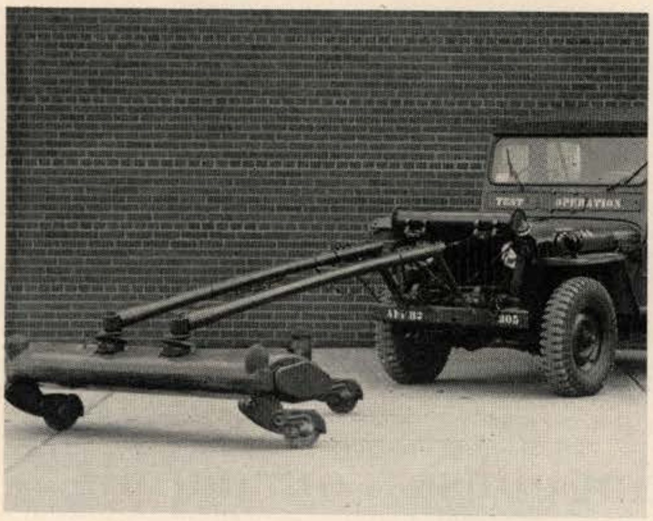
If any one facet of modern, military operations can be said to be uppermost in our minds as we engage in our programs of user test of equipment for the field army, it is MOBILITY. It has been said, and I believe rightly so, that the history of man is the history of his weapons. Our modern concepts of warfare which envision dispersion, nuclear weapons and the use of small, compact combat units, are the climax of thousands of years of progress which man has made since he initially learned that he could move faster and easier on his feet than he could on "all fours." To a great extent, this knowledge has been used in furthering the means by which he could transport himself and his weapons to the field of battle. So here at Board Number 2, we view each new item of equipment from the standpoint of whether it will improve our methods of transporting the soldier and his weapons to the combat area and continue to serve him throughout the engagement with a minimum of maintenance and with the maximum of service and combat effectiveness. Consideration must also be given to the requirement that the equipment survive the rugged phases of indoctrination and training which in many cases are a greater test than the battle itself. Our big question then, is "Will this item serve the troops with the effectiveness and efficiency for which it was intended?" The following items of equipment have been selected as samples of the types we are currently testing to insure that this question can be answered in the affirmative.

COLONEL JOHN C. WELBORN, Armor, President of Board Number 2, CONARC, graduated from United States Military Academy in 1932. He has served as Armored Research and Development Staff Officer in Army Ground Forces and as Chief MAAG—Chile. He is a graduate of the National War College and was an instructor at the Army War College. He was assigned Chief, Combat Vehicle Section, Board Number 2 in August 1955 and was appointed President of the board in February 1956.

The Vehicular Mounted Metallic Mine Detector AN/VRS-2

By COLONEL ELLIS O. DAVIS

The Corps of Engineers is primarily responsible for finding or making routes for movement. In World War II and Korea, land mine warfare matured. Mine fields are relatively quick and easy to lay, and so effective that we must be better able to cope with them in any future war. The problem is one for all combat arms, not solely the Engineers. Mine detection and clearing is slow, tedious work; it must be accelerated to match the tempo of increased mobility. Many approaches to the problem have been or are being investigated. One that shows great promise is the AN/VRS-2 vehicle-mounted metallic mine detector, developed by the Engineer Research and Development Laboratories, Fort Belvoir, Virginia. This detector set is currently mounted on the M38A1 ¼-ton truck, and weighs approximately 700 pounds. The nonmetallic



carriage box which incloses the search coil is supported by three castor type wheels. The ground pressure of the carriage box assembly is reduced to approximately 100 pound by the use of a counterbalance spring which is mounted on the front of the vehicle. The detector can sweep a lane directly in front of the vehicle or may be shifted right or left for additional coverage. An automatic braking system is incorporated in the equipment to stop the vehicle when a mine is located. In addition, the detection of a mine causes a red light to flash on the indicator panel and an audible signal to be heard in earphones worn by the operator. The set will detect all types of metallic mines buried at normal depths. It is the first of a series of such vehicle-mounted detectors.

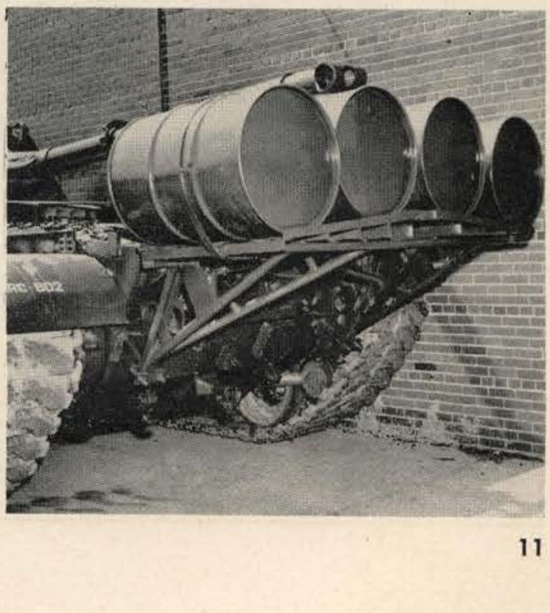
COLONEL ELLIS O. DAVIS, CE, Chief of Engineer Test Section of Board Number 2, CONARC, graduated from the USMA in 1934. He is a veteran of three European campaigns and seven Korean campaigns. He is a graduate of the Engineer School and has completed post-graduate courses at Massachusetts Institute of Technology. He was Director of Combat Developments Group of the Engineer School at Belvoir prior to being assigned to the Board. He joined Board No. 2 as Chief, Engineer Test Section in July 1956.

Universal Jettison Fuel Tank Kit For Tanks

By CAPTAIN ROBERT W. CUNDIFF

All agencies in the vehicular branches of the research and development field are constantly striving to increase the operating ranges of our current vehicles. In the tank field, this factor is particularly important as we progress to heavier vehicles which in turn require higher horsepowered engines, which again in turn require increased fuel carrying capabilities. Although much progress has been, and is being, made in design features of our combat vehicles which tend to decrease weight requirements without affecting armor protection and firepower, a great deal is left to be desired in this field if we are to get the maximum operating range from our on-tank fuel. Administrative and approach marches take their toll of the fuel and often force the tank to enter the combat zone with only partially filled fuel tanks.

Although not the ultimate answer to this problem of restricted range, the jettison fuel tank kit which we are currently testing has shown that it can add many miles to the operating range and, more important, will permit the tank to enter combat with full fuel tanks, when this would otherwise not be possible. Designed for adaptability to all classes of tanks, this kit consists of a rack and necessary attachments to carry four standard 55-gallon drums which are connected by fuel lines containing quick-disconnects to a single fuel line that leads to the fuel pump of the tank engine. The rack-mounted drums provide approximately 190 additional gallons of usable gasoline. Installed on the tank, the overall weight of 2,200 pounds and reduced angle of departure, do not adversely affect the operation of the vehicle. The additional range obtained more than



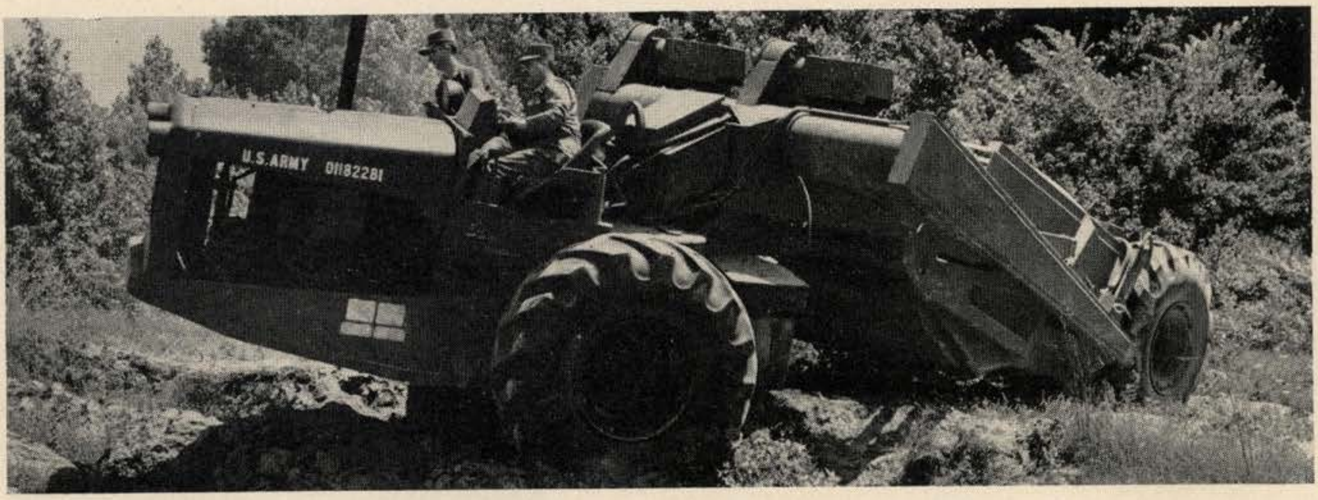
compensates for these undesirable features. A jettisoning device which is controlled by the tank driver, permits jettisoning of the drums from within the vehicle when this becomes necessary. Both temperate and desert testing have been completed and arctic testing is now being planned. This kit has definitely proven its potential, as an interim measure, in increasing the operating range of our family of tanks.

CAPTAIN ROBERT W. CUNDIFF, Artillery, served during World War II as tank commander with the 644th Tank Destroyer Battalion in the European Theater. He was recalled to active duty in 1950 and served until 1952 with the 452d AFA Battalion. He joined Board Number 2 in 1948 and has served with the Board as a civilian except for AD time. He is now assigned as test officer with the Combat Vehicle Test Section of Board Number 2. He is likewise the project officer for the jettison fuel tank kit for tanks.

The LeTourneau-Westinghouse Tournapull

By CAPTAIN JOHN F. HIGGINS

In addition to conducting service tests on equipment specifically developed for use by the field army, another important function performed by Board Nr 2 is that of advising the Army of civilian equipment capability which might have application for military use. One such item currently undergoing evaluation here as a possible cargo hauler in the Army's tactical wheeled vehicle fleet is a standard Corps of Engineers Model "C" Tournapull. Manufactured originally by R. G. LeTourneau, and now being produced by LeTourneau-Westinghouse, this item has been in use for several years by contractors for earth moving and highway construction. Tests have proven that this vehicle has the answers to many of our questions concerning the means for increasing the payload to gross load ration which has been plaguing the Army for the past 30 years. Although the curb weight of this vehicle is only 17 tons, it is capable of carrying 19 tons of payload, and through the use of positive wagon steer, can make a 180 degree U-turn in a roadway less wide than the vehicle is long. It has no springs, no exposed steering linkages and no universal joints. Steering is independent of the power train and is accomplished by a powerful electric motor geared to the king-pin which swings the prime mover at the touch of a switch to 90 degrees left or right. In spite of its lack of springs, the large diameter, low-pressure tires provide for a more comfortable ride than conventional vehicles, while giving it much more cross-country mobility than any standard Army vehicle, particularly in the mud.



CAPTAIN JOHN F. HIGGINS, Infantry, graduated from the Infantry Officer Candidate School at Fort Benning, Georgia in 1942. He served during World War II with Company D, 60th Infantry Regiment in the European Theater. He was the Regimental Motor Officer of the 6th Infantry Regiment in Berlin prior to his joining Board Number 2. He was assigned to the Board in November, 1955. At the present time he is the project officer for the LeTourneau-Westinghouse Tournapull.

editorial

Exploiting Our Potential

Recently, our Chief of Staff made the statement, "One of the most striking improvements in the Army's mobility is the development of Army aviation." This is indeed a tribute to our far-thinking Army aviation enthusiasts.

But what are we in Armor doing to exploit this potential? For years we have considered ourselves to be the arm of ground mobility. It would seem a natural that we should explore every possibility of incorporating this mobility potential of Army aviation into our plans.

From the home of Armor, Fort Knox, to the individual tank platoon stationed anywhere in the world, we should constantly strive to capitalize on the potential of Army aviation to re-establish our classic striking role. This is not to suggest that mobility is strictly a matter of machines. It is partially a state of mind. Thus we should incorporate Army aviation not only in our organizations but also in our tactical planning and thinking.

Despite widespread impressions to the contrary, Army aviation does not lessen the Army requirement for aviation support from the other services. Army aviation is unique in that it operates in the forward areas on unimproved strips. It literally lives with the combat soldier. It is integrated into unit tactics at the lowest tactical level. It supports every soldier in Armor who has the mission of closing with the enemy.

Do we in Armor exploit Army aviation to the fullest? Are we taking advantage of the many functions it now performs in support of combat operations in the combat area, and are we searching vigorously for new and better ways to employ its capabilities? Functions now being performed are:

1. *Observation.* This is a principal Army means of locating enemy targets, adjusting fire and obtaining enemy information in the local areas and in many instances it provides intelligence not otherwise attainable by other reconnaissance agencies. In our tactical exercises, are we adapting Army aviation to Armor's requirements for observation?

2. *Rapid movement* of small units within the local area. This includes the rapid movement of small units, the execution of small air-landed operations, the movement of reserves, and the shifting or relocation of units or individuals, but does not include joint airborne operations. To move our infantry over close-in obstacles, whether natural or man-made, are we utilizing Army aviation to the fullest?

3. *Rapid movement* of critical supplies by helicopters and fixed wing aircraft. This should be reserved for urgent, critically needed items. In our planning, do we consider the employment of Army aviation for emergency supply?

4. *Augmentation of land reconnaissance.* By integrating fixed wing aircraft and helicopters into our present-day reconnaissance organization, we will modernize these forces, increase their mobility differential, and extend their range. Such operations by Army aviation are intended strictly to improve our present-day ground reconnaissance capabilities and are not in any sense a substitute for "tactical reconnaissance" by the Air Force. Do we employ Army aviation fully and at the lowest tactical level within our reconnaissance units?

5. *Command.* The command function is highly important. With the dispersal of small tactical units on the atomic battlefield, the commander must be able to move from unit to unit swiftly. This function is generally well recognized and widely utilized at the present time. Nevertheless, do we see that our commanders employ Army aviation to the maximum in order that they obtain the greatest possible benefit from personal contact with their subordinates?

6. *Casualty evacuation.* Not of least importance is the ability to speed up battlefield casualty evacuation, thus reducing the mortality rate and improving morale. This was proved in Korea and is probably better known, owing to its humane appeal, than any of the other functions. Do we emphasize this function of utilizing Army aviation in our exercises?

If a tank platoon leader is delayed by an enemy during training or combat, he should be able to call on Army aviation to act as his eyes, thus immediately giving him all information possible as to the location, size and type unit that is confronting him. This aviation capability must be controlled by the local Army ground commander. This does not imply that everyone commanding a platoon must have an Army airplane. But it does mean that every battalion, regiment, combat command or division commander having organic Army aviation must integrate Army aviation operations into the tactical operations of his other Army units at the lowest feasible levels. If properly utilized, Army aviation will greatly increase the overall capability of forces at all levels.

There will always be a need for Armor on the atomic battlefield to do the heavy slugging job. Active and imaginative use of Army aviation will serve to better project Armor on this broad battlefield. Thus we can achieve a legal marriage between these two highly mobile organizations. It is well to remember that the arm which is more mobile minded is likely to be the more mobile arm.

A statement by Major General Hamilton H. Howze, Director of Army Aviation, sums up the Army Aviation-Armor situation from the viewpoint of one who has extensive experience and equal interest in each. He said: "The question is whether Armor is capitalizing on the capabilities of Army aviation. My opinion is that it is not. Armored doctrine does not reflect the many ways in which light aircraft and helicopters can assist tank and armored infantry forces in the execution of their battle missions; neither are our schools and armored formations experimenting sufficiently with the use of aircraft. If we really claim to be the mobile arm, we should exploit every possibility to augment our mobility."

No public relations campaign, no matter how well conducted, can transform the "product" it is intended to boost. More simply, the public will believe what they see rather than what they are told.

U. S. Army

CARDED

THE ARMY TAKES IT ON THE CHIN

By FIRST LIEUTENANT WILLIAM V. KENNEDY

THE public had arrived in droves to gape at the "open house" attractions of the new bomber base. Inside a huge hangar, visitors walked the length of a B-36 wing in a continuous stream.

Outside, as the National Anthem was played, three giant B-36's flew overhead, shaking the earth with the roar of 30 mighty engines. The band paused, then went into a spirited rendition of "The Air Force Song."

In the middle of the chorus, from out of the blue behind the crowd, three F-89 twin-jet "Scorpion" fighters screamed overhead, then barrel-rolled into a distant cloud.

The spectators, needless to say, were enthralled.

Scarcely a year earlier, this writer recommended to an artilleryman that, as part of an Army "open house," he have one of his truck-drawn Artillery batteries go into action on a field in front of the crowd.

"No," the redleg replied in a most patronizing manner, "we don't have any glamour like that."

A few days later, I watched one of those units go through a battery test, stood in the dust as the trucks and the howitzers jolted by, watched the crews scramble out and manhandle the guns into position, heard and felt the roar of the guns. I walked away convinced that my Artillery friend might be impervious to his own glamour, but that Joe Citizen would have eaten it up.

Read through the "funnies" next Sunday and compare the treatment of the Army to that of the Navy and Air Force. "Steve Canyon" presents an array of handsome, neatly attired, competent Air Force officers and men, grappling with danger in every corner of the globe and surrounded by a never-ending parade of beautiful women.

On the opposite page we find "Beetle Bailey." And if the Army doesn't look silly enough there, one need only turn to television's "Sergeant Bilko."

The simple truth arising from this comparison is that the Air Force has caught the imagination of the American public and the Army has not.

There are many and varied reasons for this circumstance. Some reasons stem from social, historical and military circumstances over which the Army has had little or no control. Others arise from attitudes and practices on the part of the Army itself. The expansion of the Army in World War II, reckless demobilization, a technological revolution in warfare

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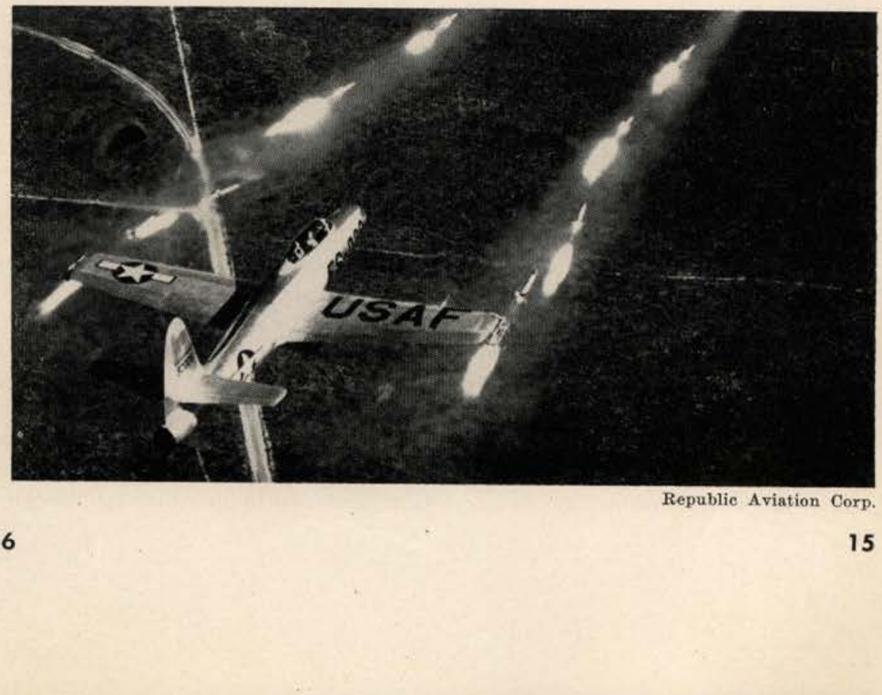
FIRST LIEUTENANT WILLIAM V. KENNEDY, Armor, is a free a lance military analyst and a National Guard officer with the 104th Armored Cavalry Regiment, Pennsylvania National Guard. He has had experience as an editor and a newspaper reporter. He has been a Public Information Officer in both the Army and the Air Force.



The Air Force and other services have caught the imagination of the American public and the Army has not.

Republic Aviation Corp.

and an insidious intellectual campaign against military authority, institutions and traditions are among the larger problems over which the Army has had little control.

In those areas over which the Army does have control, however, a great deal can be done to solve what has become a serious public relations problem.

The Army's public information staff is as well qualified, as aggressive and as enthusiastic as those of the Air Force, Navy and Marine Corps. The value of good public relations has long been recognized by the Army's top leadership. But no public relations campaign, no matter how well conducted, can transform the "product" it is intended to boost. More simply, the public will believe what they see rather than what they are told.

From World War I on, what the public saw of the Army could hardly have been more dismal. Olive drab is drab indeed. The potential recruit needed only to compare the spectacle of himself in OD and in Navy blue to be overwhelmed by the lure of the sea.

Significantly enough, the Air Force got rid of olive drab just as fast as it could. The present change-over from OD to the new Army blues and greens just can't be completed too quickly.

The appearance of Army units *en masse* is second only to the appearance of the individual soldier in its public relations value to the Army. In this regard, the herd appearance of our present parade formations could hardly be more damaging.

Nothing could be more destructive of the individual's conviction that he is an important and respected spoke in the wheel than to be placed in the middle of a massed battalion where he can scarcely breathe and where he is but one more helmet liner to his girl, his family and the multitudes.

Contrast the silent, shuffling, sweating, almost formless crowd of Americans in "massed front" with the free-swinging, open order, the bright touch of plaid and the skirling of pipes of a Highland unit on parade. Small wonder that one battalion of Scots can create a more favorable and more lasting impression than an entire American division.

U. S. Army

Nothing is more destructive to the individual's conviction that he is an important spoke in the wheel than to be placed in the middle of a massed formation where he is but one more helmet liner to his family and the multitudes.

We learned long ago that some of the most important fundamentals of a man's military character are formed on the drill field. It follows that by adopting an open order drill on the British model a powerful incentive could be provided toward pride in uniform, pride in appearance and pride in unit.

An essential element in regaining public respect and affection for the Army is the return of martial music to a prominent place in regimental and battalion formations. The expense of maintaining a full military band at these levels can be avoided by adopting two musical units that have already won enthusiastic public acceptance—the drum and bugle corps and the pipe band.

There should be little difficulty in recruiting enough experienced musicians from a battalion-size unit to organize a drum and bugle corps. Indeed, the assignment of these men to a single platoon would not seem impossible, considering the large number of young Americans who have already played in a high school band or a military veterans unit. The added time and effort required of the "drum and bugle platoon" for practice could be made up by granting special pass privileges and freedom from most other details.

With a new, dramatic drill and parade formation and cadence, a drum and bugle corps in each battalion and a pipe band, complete with the full tartan costume at regimental level, the United States Army could present an inspiring spectacle to itself and to the nation.

A third factor in the Army's public relations dilemma is a conviction on the part of the general public that the Army represents a reactionary, hidebound military philosophy that still sees the Infantry as the dominating element in war. Despite an almost studied ignorance of military affairs, the average American was quick to grasp during World War II that the future rode with Guderian, Wavell, Rommel, Patton, Montgomery and LeClerc, operating under cover of that most crucial element of all—air power.

The Special Forces, the airborne divisions and the "straightleg" Infantry all have important roles to play in modern land warfare. But it is the armored forces that "carry the ball."

The great mistake of post-World War II Army public relations policy has been the failure to acknowledge the dominance of the mounted soldier.

Instead, the mounted soldier has been relegated to a status equal or subsidiary to that of the Infantryman. His historic title, "trooper," has disappeared from formal use. The First Cavalry Division and its hallowed regiments have been reduced to meaningless, incongruous titles. Worst of all, the mounted soldier, in his field jacket, starched collar, stiff hat and infantry boots, is indistinguishable in appearance, and all too often in thought, from the Infantryman.

During a tour of active duty last winter, this writer had the curious experience of being called down for wearing a tanker jacket by a senior Armor officer in front of the Headquarters of The Armor School.

Korea was, in more than one respect, the worst thing that could have happened to the United States Army. With its artificial environment and its resultant rebirth of the hopelessness and the stupefaction of World War I-type warfare, it convinced far too many Army officers that this was the pattern of land warfare for all time to come.

The cumulative effect of this retrogression in large parts of the Army has not been lost on the public. "Beetle Bailey" and "Sergeant Bilko" are but two expressions of a widespread belief that the Army is incapable of freeing itself from the mud of the trenches, that it is composed of slightly addled old fuddy-duddies and that the hope of the nation lies exclusively in the air.

The conversion of six National Guard divisions and a number of smaller organizations to Armor was the first glimmer of hope that this misconception may soon be dispelled. That hope has been brightened by the current proposal that the "reconnaissance" units of the armored, infantry and airborne divisions be called by their rightful title—"armored cavalry."

The re-birth of the Cavalry spirit is essential if Armor is to assume its proper place in the public mind as the symbol of land power. The first step in this direction is to dress the mounted soldier as a mounted soldier, and not as an Infantryman who for the moment happens to be riding in an armored vehicle.

For the field uniform, the tanker jacket and the Dehner boot are ready at hand. As has often been suggested, the black beret, symbol of the armored soldier the world over, could be adopted as a distinctive and practical substitute for the stiff hat of the field uniform and for the visored hat of the dress uniform.

Return of the title "troop" for the company-size unit in all armored formations and "trooper" for the private soldier and the specialist is essential to the re-awakening of a truly cavalry esprit de corps.

In the organizational field, the first and most pressing need is the conversion of the First Cavalry Division to Armor.

It would seem wise from the standpoint of both tradition and of the world situation to retain the regiments of the First Cavalry Division as armored cavalry regiments rather than converting the division to an armored division as we presently know it.

The withdrawal of the Western Allies from large areas of the Middle East and North Africa makes it almost certain that the United States will sooner or later be forced to take responsibility for those vast regions.

Cavalry divisions, each composed of three armored cavalry regiments and appropriate supporting units, could perform this mission far more effectively than any number of infantry divisions and far more economically than heavy armored divisions. The same holds true for the desert and steppe regions of North China, Mongolia and Central Asia.

Once it is made clear to the American public that Armor, with its speed, its striking power, its freedom from the morass of linear warfare and its capacity for great and total decision, has become the central and dominating force in the United States Army, the present public relations problem will have been solved.

Few Americans want any part of an organization they believe to be archaic in its thinking and incapable of dealing effectively with the problems of the day. The fact confronts us that, justified or not, a great portion of the American public has come to think of the Army in these terms.

To regain its rightful place in the esteem of the American people, the Army must prove that it has a place beside the air and sea elements of the atomic age. Only an Army of which Armor is the heart and the principal striking force can furnish that proof.

U. S. Army

A great mistake, which can and should be corrected, in our public relations policy has been its failure to acknowledge the dominance of the mounted soldier.

U. S. Army

A platoon in "D" maintenance, power packs removed, mechanics and crews checking hulls and suspensions.

ONE WAY TO GOOD MAINTENANCE

By CAPTAIN FRANK E. DIGIROLOMO

CAPTAIN FRANK E. DIGIROLOMO, Armor, received his commission from OCS in 1942. He served in Europe during World War II with the 6th Armored Division. He reverted to civilian status in 1945. Returning to duty in 1947 as an enlisted man he assumed commissioned status in 1952 and was assigned to the 509th Tank Battalion. After attending the Associate Advanced Armor Course at The Armor School he was assigned to the 826th Tank Battalion in Europe where he is now the Battalion Motor Officer.

A SOUND and workable system of maintenance, first and second echelon, has been the goal of most tank battalions for a number of years. Modern equipment now in the hands of the troops, with all its complexities, has only added to the burden and certainly made the goal seem a little more distant. On the subject of maintenance, countless thousands of words have been expressed, verbally and in print. Everyone has expressed opinions, commanders have made demands, printed matter has come forth, some suggesting, some outlining, and much of it specifying, and the little man has strained his back, many times to little or no avail. It is felt that a sound and workable system has not as yet come into effect. The system that is outlined is, as the title implies, "One Way to Good Maintenance."

This battalion was faced with the

In the May-June 1956 issue of ARMOR *there was a fine article entitled* Maintenance in the Modern Army. *This article emphasized the fact that command attitude toward organizational maintenance is the heart and soul of any workable maintenance system and that every individual in the chain of command must know how to care for his assigned equipment. The latter part of this statement is a great problem area in our tank battalions today because our junior officers and tank crewmen are mainly young inductees who are assigned, trained and leave for civilian life before we get the maximum benefit of their training.*

We, in the 826th Tank Battalion, believe that we have a solution to the organizational maintenance system. The methods outlined in this article were placed into effect about two years ago and it is now a matter of record that the battalion has attained a systematic method of scheduled maintenance, a high degree of training of the junior officers and tank crewmen on maintenance duties and has motivated all members of the command to the point that they are "Maintenance Conscious." **Lt. Col. Walter J. Davies, Battalion Commander.**

usual commanders' maintenance problem, indifferent first echelon, inability to maintain scheduled "D" checks, vehicles that were constantly breaking down, and a lethargic attitude toward maintenance by all, resulting in what seemed to be a losing game. Several approaches were attempted without success. Night work was tried, closer supervision made the keyword, strict disciplinary action taken, but the rut was too deep. These were the common approaches. What was needed was a radical approach that would provide a stimulus.

About 18 months ago the "Platoon System of 'D' Maintenance" was put into effect. Since its inception the system has been carefully watched, not only by members of this battalion but also by other commanders, who, after watching and waiting, are convinced the system will work and are putting it into effect within their commands. The system was a success from the beginning even though it had several "bugs" most of which have been eliminated within the last six months. As it stands at present it can be put into effect in any tank battalion with very little effort. The results certainly have been gratifying; first echelon has attained extremely high standards, there are better informed personnel at all levels, scheduled "D" checks are being maintained and are accomplished as they should be, personnel have become very maintenance conscious, all resulting in excellent and superior ratings in all command maintenance inspections and IG Inspections. In the finished analysis this unit is in excellent condition to meet any sustained tactical requirement without equivocation.

As is well known, there are four types of maintenance checks required within first and second echelon maintenance: A, B, C and D. "A" is the daily maintenance check usually performed by the operator or crew. "B" is a weekly check, also usually performed by the operator or crew. "C" is the maintenance check performed by the company maintenance crews, and "D" is the type check performed by the battalion maintenance crews on a quarterly basis. The checks as outlined refer to track type vehicles only. The system deals with only track vehicles for in solving this big problem, the wheeled vehicle problem was also resolved.

Properly supervised first echelon maintenance is the very heart of any maintenance program and we made the entry through the back door in resolving the first echelon problem by setting up the Platoon system of "D" checks.

The platoon system of "D" checks is carried out as follows: The Battalion Motor Officer first schedules his "D" checks not by individual vehicles but by platoons or by "groups" of vehicles on a weekly basis. The platoons or "groups" are scheduled so as to report in each Monday. This is done so that entry and departure from battalion maintenance will happen within one specific week. A "group" of vehicles is to be construed as approximately five vehicles not normally in a platoon, such as the VTR's, M74's, APC M59's, company headquarters sections, etc. By this scheduling every unit knows well in advance when its elements are due for scheduled maintenance. In the event that training requirements may prevent a scheduled platoon from reporting it is easy to either advance or retard the check by a week or so. The S3 section also has the schedule to assist in scheduling training so as not to interfere with the maintenance program.

When the platoon or group reports to battalion maintenance all the assigned personnel come with it. This includes the platoon leader and/or the section chief. The Standing Operating Procedure (SOP) (shown on the next page), for the vehicle crew is given to each commander for guidance and compliance. *(See Figure 1.)*

During the period a platoon is in for "D" check the crews attend only the mandatory training classes. The time spent on "D" checks is considered "On the Job Training." Justifiably so, are they not involved in actual training and in contact with their equipment? As much so as the Infantryman with his M1 or the Artilleryman going through the "loaders hop?" What the crews learn during the week they are in for "D" maintenance

SOP FOR VEHICLE CREW

FROM: Battalion Motor Officer

TO: NCO or driver in charge of Vehicle #__________

1. From the time this vehicle is accepted by Battalion Maintenance until it is released to return to your company, the crew will be under the control of the battalion mechanics assigned to your vehicle to perform a "D" check.

2. It is your responsibility to see that the crew is present each day the vehicle is in the battalion shop.

3. The crew will perform all duties assigned by the battalion mechanic.

4. The crew will observe the same "break" periods as the battalion maintenance section, 1000 to 1020 hours in the mornings and 1500 to 1520 hours in the afternoon. Crews will not leave the shop at noon and evening until the battalion maintenance section leaves.

5. You will contact the shop foreman on anything you do not understand or for any complaint you may wish to make.

6. Make sure it is brought to the attention of the shop office or Battalion Motor Officer before the vehicle is returned to your company, if you are not satisfied with any phase of maintenance that has been performed or not performed on your vehicle.

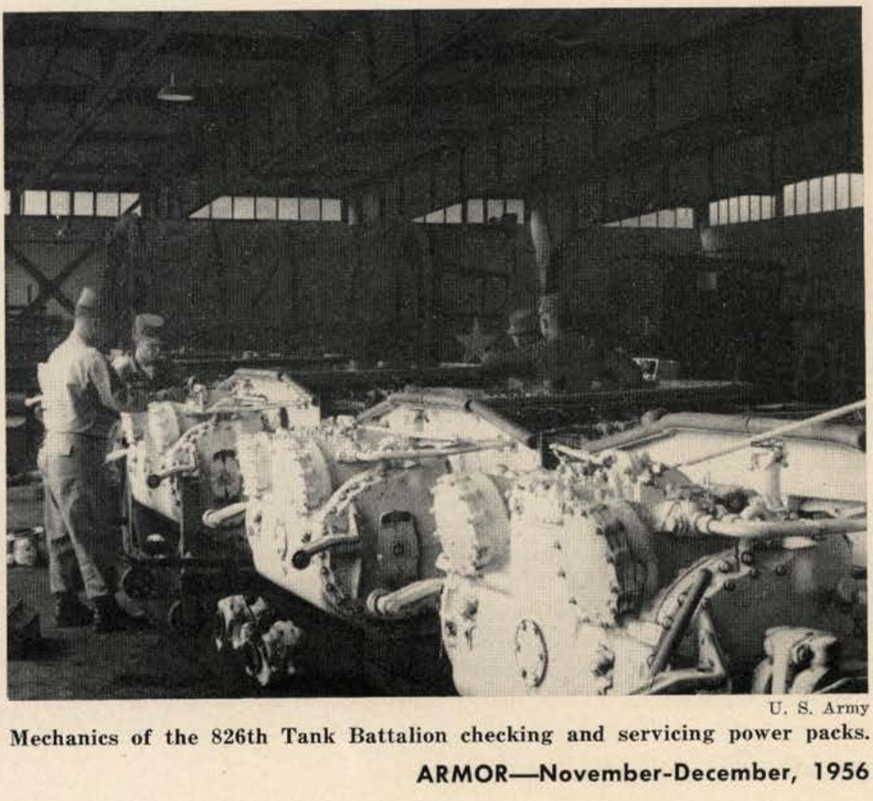
NAME:____________________

RANK:____________________

is invaluable in taking further care of their vehicles.

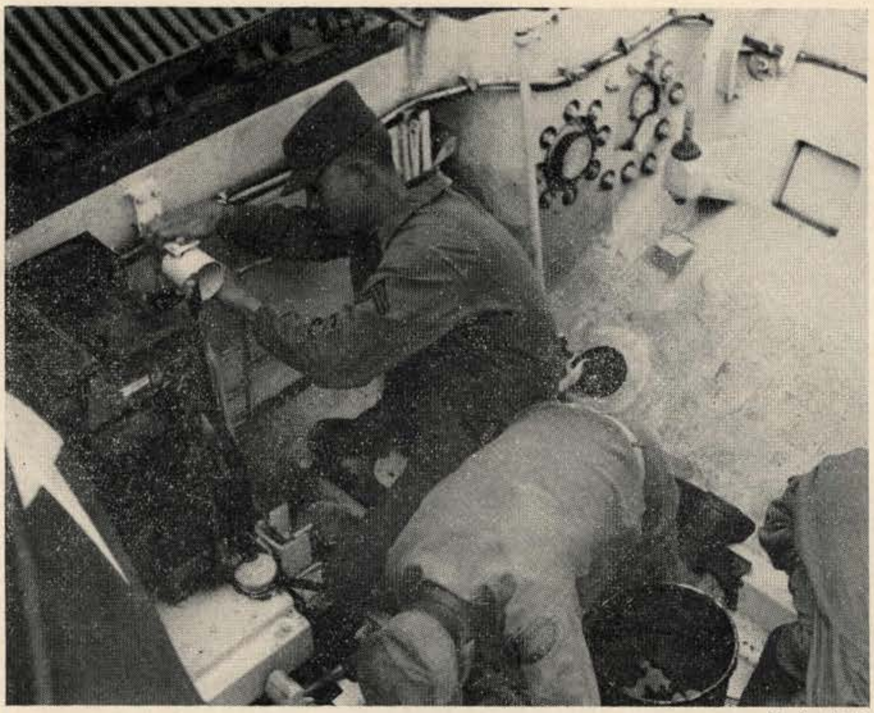
As soon as the vehicles arrive at battalion maintenance, the crews and the mechanics go to work together. One or two mechanics are assigned to each vehicle. The crews assist in removing the armor deck and power pack. After removal of the power pack the crew cleans out the hull and the power pack. The crew is present and assists in checking all road wheels and track support rollers for condition of bearings and seals, steering and brake linkage, electrical connections, and in checking out the many other controls and units, new in the modern tank. It also assists in draining oil from engine and transmission, disassembly, cleaning and assembly of all filters, observes how the transmission bank is checked and adjusted, the engine timed, the magnetos adjusted, and the final running out of the engine. By observing and assisting in all these procedures the crew becomes more familiar with the vehicle and has opportunities to ask questions which mechanics must answer. The crew can also bring to the attention of the mechanics deficiencies or peculiarities on its vehicle and no deficiency is ignored or too small to be corrected. The crews assist in the reassembly of their vehicles. When the crew leaves battalion maintenance it has a vehicle that operates to its satisfaction and better yet—realizes that it had something to do about it.

It has been found that once a crew has been through one of these checks it takes a greater interest in the vehicle and tries harder to maintain it in tiptop condition. It definitely has a better understanding of how to do it. It may be added here that prior to leaving battalion maintenance it also performs a complete first echelon service under the supervision of a mechanic. This clears up many misunderstandings as to what is really involved in a good first echelon service, such as types of lubricants, quantities required, frequency of servicing and how to look for trouble spots. All of this adds to the knowledge of the crew and assists it in performing all first echelon maintenance in the proper manner and further assists it in diagnosing troubles which can



U. S. Army

Mechanics of the 826th Tank Battalion checking and servicing power packs.



U. S. Army

Tank crews of the 826th Tank Battalion shown cleaning an engine compartment.

be and are corrected by the crew. The ability of the crew to do this cuts down on further wear and tear on various parts which would otherwise be exposed to abuse.

Some of the questions normally asked by persons inquiring about the system are:

Question: How can you justify your scheduling on the PM roster which extends over a period of approximately four months instead of three as is normally prescribed for this type check?

Answer: Within a tank battalion there are 88 track type vehicles. Any motor officer can schedule these on a quarterly basis but it is not likely that a battalion maintenance section can accomplish complete "D" checks, on schedule, under the present T/O&E. The Battalion Motor Officer who is unscrupulous and the commander who is ignorant of maintenance procedures will permit "paper" checks and they wonder why the equipment is constantly breaking down when they hit the field. Paper checks are ruining good equipment. Try as you may it is not possible to complete a good "D" check on a track vehicle in one day. According to the number of vehicles and time allowed, every tank battalion must schedule and complete 88 "D" checks in approximately 72 working days. It is better to schedule the possible and do maintenance properly than to "half do" maintenance and maintain an impossible schedule. If the inspectors during any type inspection want to "gig" you for being behind on your scheduled maintenance it is possible that you may lose one point in the overall scoring. You will more than make this up in the mechanic phase of the inspection. The scoring of inspections, at present, allow a final of ten points for phases of maintenance procedure and a weight of 90 on condition of equipment. The decision is not hard to make.

Question: How does this system help your wheel vehicle maintenance?

Answer: By utilizing the crews during a "D" check the work load in battalion maintenance is usually cut down to two track mechanics per track vehicle. This allows you to "beef up" that section of battalion maintenance performing wheel "D" checks. The drivers of all wheel vehicles accompany their vehicles to battalion maintenance and they too are exposed to the same conditions as the tank crews. The 826th Tank Battalion has one SFC and four to five wheel mechanics in the wheel section and they pull what is considered an excellent "D" check and also keep on schedule.

Question: How is the training of crews accounted for on the training schedule for the week a platoon is in "D" check?

Answer: The Battalion Commander considers that period as important training.

The S3 section schedules that period, for that particular platoon, as "D" maintenance on the training schedule. This one week period, that any crew, over a four month period, is in "D" maintenance pays off big dividends in producing a better qualified tank crew.

In addition to having what is considered a good sound maintenance program in operation, good maintenance relations have been established. This is evidenced by the appearance of commanders at all levels during maintenance periods. It is not unusual for the Company Commander to consult the Battalion Motor Officer as to the condition of the platoon that is currently in for a "D" check. Commanders are more familiar with maintenance policies, problems and terms than ever before. They can go to their motor pools and observe with understanding, and have the ability to converse with maintenance personnel and not be fogged by terms such as current work files, 461's, 463's, PM rosters, weeklies, etc. Armed with this knowledge they have confidence and there is no hesitancy on their part to take corrective action against poor maintenance practices. The crews understand that the mechanics are vitally interested in helping them, and the mechanics also realize that the crews are doing the best they can in taking care of their vehicles. This relationship certainly adds to the success of any maintenance program.

Maintenance has always been a command responsibility and it has always been a thorn in the commander's side. It is felt that the commander is justified in the means as long as the end result is successful. The 826th Tank Battalion likes this system and feels that it has solved the major maintenance problems a tank battalion usually has. Our mission is to move, shoot, and communicate; we intend to get there "fustest with the mostest." In answer to General H. I. Hodes' question, that he often asks, "Can you make them gallop?" This battalion answers with a hearty "YES SIR!!!"

REPLACEMENT IN THE ARMORED

Prepared by G3 Section

IT has been said that living in the past has the comforting feeling that you have already met and solved all the problems. To a few, that may have been the feeling when last February the 4th Armored Division began the exacting task of training recruits. If it was, then the feeling was quickly dispelled; for while the 4th had been a replacement training division for a time during World War II, its new mission, the second since its reactivation in 1954, was to be no repetition of past history. Things have certainly changed since 1943.

The approach to these many problems and their solutions have given the staff members involved an invaluable experience in staff operation. Those most closely concerned have naturally been the Plans Division and Training Division of the G3 Section. As training missions are often a problem faced by individuals detailed to such positions, this account of how the 4th Armored met and overcame its problems may well help others.

It is one thing to plan the conversion of a "line" organization into one whose basic mission is replacement training, but it is quite another to make those plans into realities—working with the actual recruit and making a soldier out of him.

Planning was begun six months prior to the date on which it was expected the first trainees would arrive. On 13 July 1955, the Commanding General, 4th Armored Division, received a directive ordering him to prepare for the reception and training of a large number of trainees. These recruits, the first of which were to arrive in January 1956, would fall into three categories for training: basic combat; advanced individual, Armor; and advanced individual, Artillery.

At the time this mission was received the Division was actively engaged in post cycle training and was heavily committed to the support of civilian component Summer training at North Fort Hood. Concurrently, the division staff was immersed in initial planning for the employment of the Division in Exercise SAGEBRUSH in Louisiana during the months of October through December. The necessity for the development of early detailed plans for the accomplishment of the training mission was immediately apparent. Because of this and the workload already placed upon the staff by Exercise SAGEBRUSH, it was decided to set up under the supervision of G3 Plans, a special planning group composed of three officers and two enlisted men chosen from division units.

U. S. Army

Training—a class receiving instruction on the M48's .50 caliber machine gun.

On 1 August the planning group was organized and immediately went to work on the following problems:

1. Formulation of a logical and orderly plan for the commitment of battalions to the training mission.

2. Determination of the most feasible division organization for the accomplishment of the training mission.

3. Determination of the requirement for equipment in addition to that which was then on hand.

4. Determination of the number and type of training aids required in addition to those available at the Fort Hood Training Aids Center.

5. Survey of the training facilities and ranges to determine their adequacy.

As the planning group dug into these and other problems and as plans for participation for Exercise SAGEBRUSH took shape, it became evident that in order for training to begin in January a portion of the Division would have to be left at Fort Hood during the maneuver. Since the Division was not to return from Louisiana until early December and the first trainees were scheduled to arrive in January, it was imperative that preparations for their reception

TRAINING FOURTH DIVISION

U. S. Army

Guiding a tank is a challenge that is not always an easy one for the trainee.

and assimilation be uninterrupted. Accordingly, approval was obtained early in September to leave a reduced strength Combat Command at Fort Hood for this task. Combat Command C organized with one tank battalion, one armored field artillery battalion, one armored infantry battalion and the division replacement company was chosen. The total strength of this unit was approximately 1000 officers and enlisted personnel, many of whom were scheduled for discharge during the maneuver period. Upon the departure of the Division for the maneuver area, the Combat Command was to take over the planning initiated by the G3 planning group in addition to performing the usual rear detachment missions of guard, housekeeping, etc.

The preparation of the tremendous amount of training literature such as lesson plans, memoranda, schedules, etc., required for the conduct of the training program, was a task that loomed large before G3 in September.

In order to receive some guidance in the solution of this problem, a staff visit was made to the 8th Infantry Division at Fort Carson, Colorado, where similar training was being conducted. This visit proved to be a great benefit and two major acquisitions were made which greatly simplified the job of the 4th Armored Division planners. The first of these was a file of lesson plans and other training literature which was based on the same Army Training Program that the Division was to use. Many hours of laborious basic research were to be saved by having this literature to refer to. The other was the idea and plan for the establishment of a processing center for the trainees at which they would be received, oriented and assigned to training units.

Although the file of training literature obtained from the 8th Infantry Division was of invaluable help, it was obvious as September drew to a close that the preparation of all the training documents required could not be accomplished before the Division departed Fort Hood for Exercise SAGEBRUSH; neither would there be time to complete the project after the Division's return to the post in December. It was decided, therefore, to give this publication project to Combat Command C as an additional task to be completed during the absence of the rest of the Division.

A final directive was issued to the commanding officer of Combat Command C just prior to the Division's departure which outlined his responsibilities with respect to the replacement training program during the period that the Division was on the maneuver. These were:

1. The final reproduction and storage of Replacement Training Directives and Training Memoranda.
2. The preparation of lesson plans for cadre training.
3. A survey to determine adequacy of ranges and required training areas.
4. The requisitioning of initial stocks of training aids.
5. The completion of training schedules for the first two weeks of training for each Army Training Program.
6. The requisitioning of ammunition for the first two weeks of training.

With these tasks clearly spelled out the Rear Detachment Commander was able to take over from G3 and continue the preparations for the reception of the initial trainees.

Two changes to the original program for training were received in November while the Division was actively engaged in maneuvers. The first of these changes placed the additional requirement on the program of training advanced individual Infantrymen in addition to Armor and Artillery advanced individual trainees. As a result of this change additional Replacement Training Directives and lesson plans had to be prepared and changes had to be made in programming and scheduling. Thus, although this was in itself not a change of major proportions, a considerable increase was added to the burden of those responsible for the preparation of training literature. The second change had little immediate effect on the mission since it provided that the Division would be required to train replacement packets for another Division. This mission was far enough in the future that it could be placed safely in the background while the more urgent matters were dealt with.

The supply of training aids began to be a problem as November drew to a close, and, to insure that the necessary number and types of aids would be on hand when the trainees began to arrive, approximately 20 carpenters were obtained from division units to assist the training aids carpentry shop. These men worked three weeks building and repairing sufficient training aids for use by the training battalions. Priority systems on the use of the training aids produced were established and rigidly enforced to insure that the first units to receive trainees would have adequate training aids and equipment. In those instances where equipment was not available or was in short supply, training programs were modified. However, the only major equipment shortage requiring program changes was that of recoilless rifles.

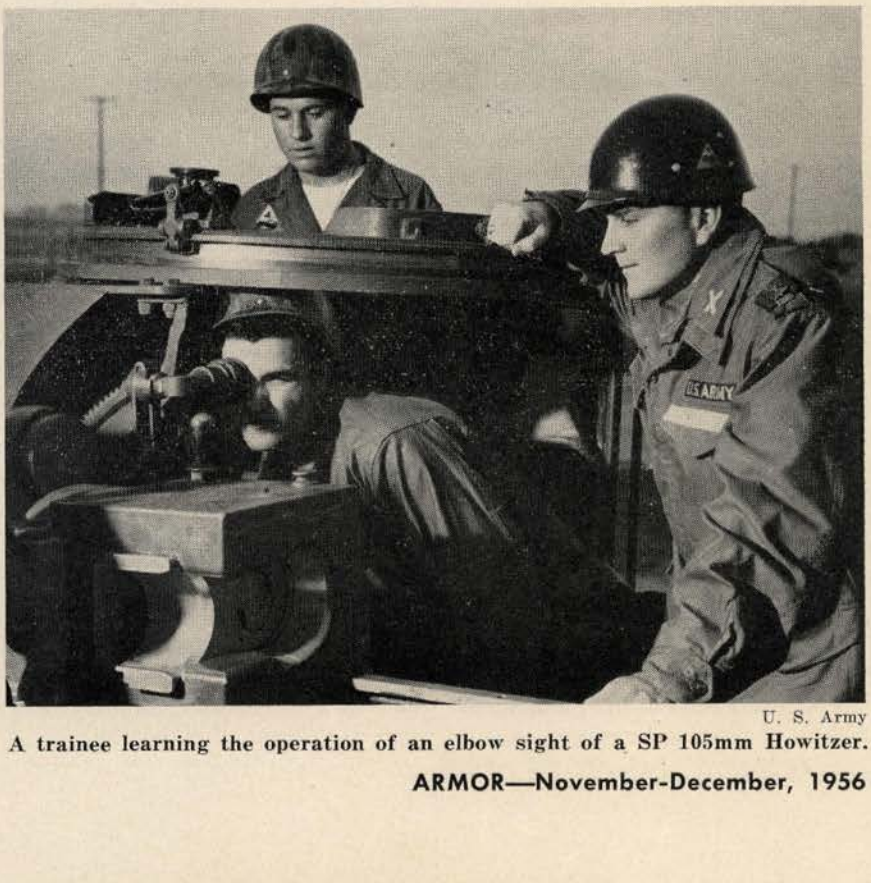
As the Division was returning from the maneuver area, word was received that the initial input of trainees would not arrive until February 1956. This allowed the planners a breathing spell in which to review, check and distribute training literature and to perfect final plans and procedures.

The Trainee Processing Center was established on 4 January 1956. The Center was organized with a strength of seven officers, five warrant officers, and 146 enlisted men who were given the mission of receiving and assigning newly arrived trainees, maintaining personnel records on all trainees and processing departing soldiers who had completed their training. Capable of processing 200 newly arrived trainees within two hours, the Center was designed to relieve the training units of trainee personnel administration and allowed them to concentrate all their efforts on the primary task of training the men.

A dry run was made on 23 January to test the procedures which were to be used by the Trainee Processing Center. A group of 100 enlisted men from the Division with records and baggage passed through the Center and were processed as trainees. A few minor deficiencies and awkward procedures were disclosed by the test; these were immediately corrected, and the soundness of the Center's plans was proved when the first 567 trainees

U. S. Army

The trainee also receives the fundamentals in the firing of individual weapons.

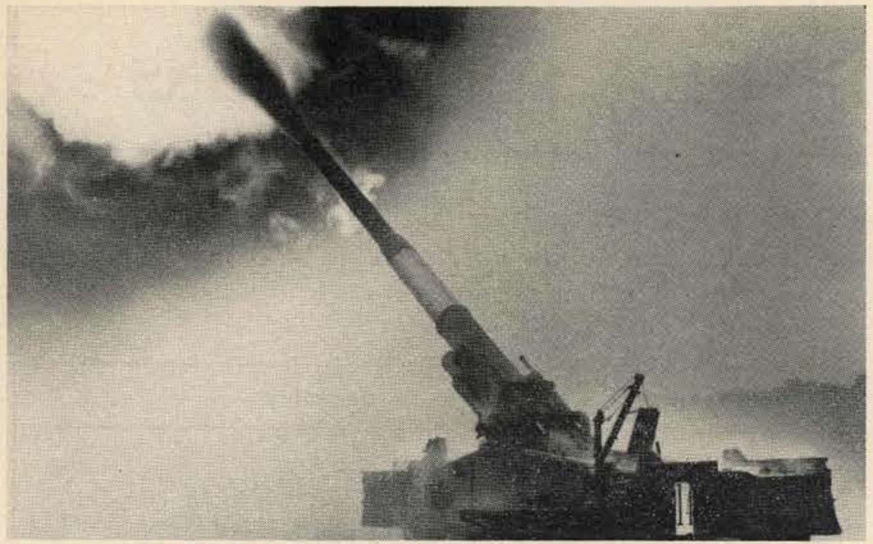

U. S. Army

A trainee learning the operation of an elbow sight of a SP 105mm Howitzer.

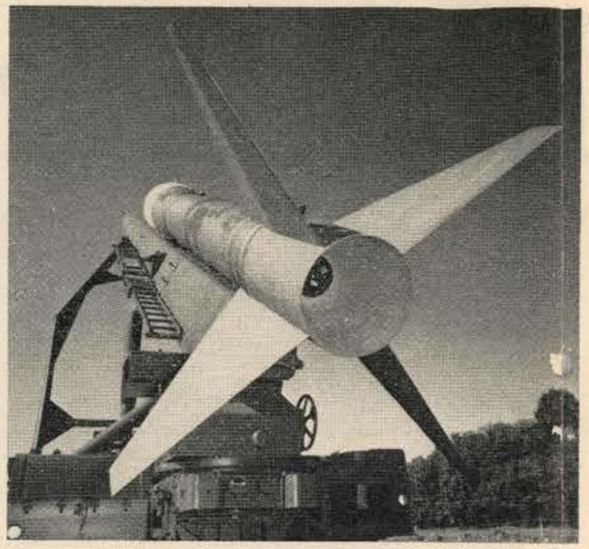
ARMORED DIVISION ASSOCIATIONS

The roundup of the Armored Division Associations, inaugurated in the 1955 November-December issue, was well received. Since this information was helpful to all of the Associations and their members, we are happy to present this year's roundup.

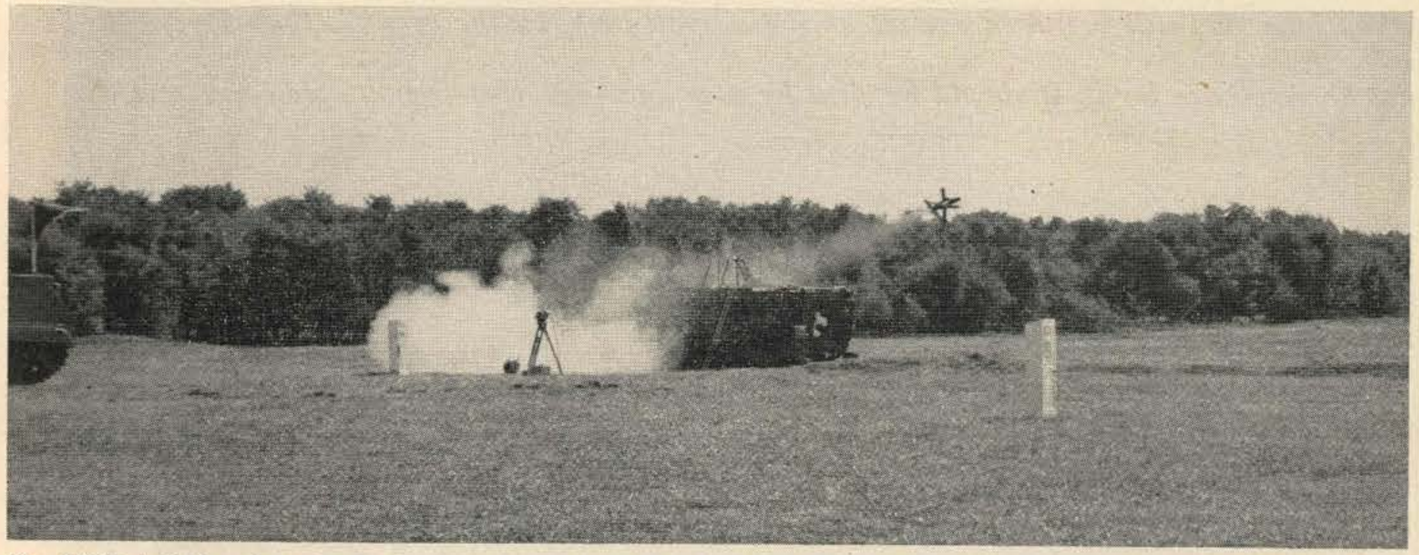
Association	1957 Reunion	Secretary
1st Armored Division	Bellevue-Stratford Hotel Philadelphia, Pa. 23-25 August	Leo B. Conner 1529 18th St., NW Washington 6, D. C.
2d Armored Division	Benjamin Franklin Hotel Philadelphia, Pa. 2-3 August	Col. R. F. Perry (Ret.) Box 172 Alexandria, Virginia
3rd Armored Division	Sherman Hotel Chicago, Illinois 26-28 July	Paul W. Corrigan 80 Federal St. Boston 10, Mass.
4th Armored Division	Hotel Carter Cleveland, Ohio 20-22 June	Anthony J. Passanante P.O. Box 42 Kearney, New Jersey
5th Armored Division	Manger Hotel Cleveland, Ohio 8-10 August	Mrs. Claire E. Watrous 8549 Lowell St. St. Louis 15, Mo.
6th Armored Division	Statler Hotel Cleveland, Ohio 31 Aug., 1-2 Sept.	Edward F. Reed P.O. Box 492 Louisville, Ky.
7th Armored Division	Hotel Statler New York, N. Y. 16-18 August	Johnnie Walker 335 Johnson Ave. Teaneck, New Jersey
8th Armored Division	Bellevue-Stratford Hotel Philadelphia, Pa. 28-30 June	Daniel M. Garside 3712 N. Lowell Ave. Chicago 41, Ill.
10th Armored Division	Unknown Toledo, Ohio 31 Aug., 1-2 Sept.	J. Edwin Grace 108 Langdon Ave. Watertown, Mass.
11th Armored Division	Ritz-Carlton Hotel Atlantic City, N. J. 15-17 August	Kenneth W. Hanlon 217 Robin Hood Rd. Mountainside, N. J.
12th Armored Division	Carter Hotel Cleveland, Ohio 1-3 August	Lt. Col. LeRoy W. Bensel 2557 Main Street Lawrence, N. J.
16th Armored Division	Sheraton Park Hotel Washington, D. C. 8-11 August	James E. Austin 100 Dee Drive Linwood, New Jersey



A 280mm cannon firing in the American Ordnance Association demonstration.



The M31, 762mm Honest John rocket and launcher.



The XSSM-A-23 Dart is a simple effective antitank missile that is propelled by a rocket motor containing smokeless propellant.

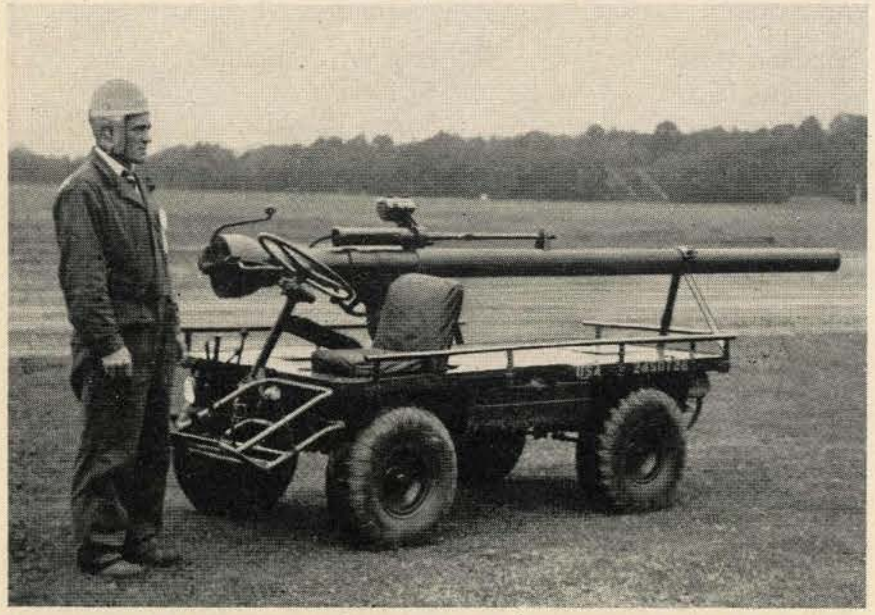
NEW EQUIPMENT

Presented on these pages and on the front cover are some new weapons never before shown to the general public. These were demonstrated by Army Ordnance before an audience of American Ordnance Association members on the occasion of its 38th Annual Meeting, held at Aberdeen Proving Ground, Maryland.

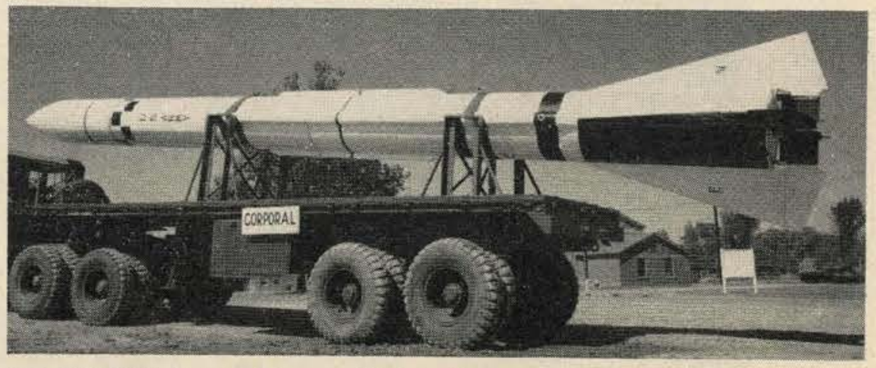
Notable among the new weapons shown were several of the Army's big missiles, including the Honest John rocket, and the new antitank missile Dart. Other missiles shown but not fired were: Nike I, Corporal, and the Redstone which is also a test vehicle for the future Intermediate Range Ballistic Missile, the Jupiter.

Among the more conventional weapons shown were an improved machine gun to take the place of several older types; a new 175mm gun with superior mobility; a new mortar; and an improved version of the M48 tank.

Gratifying to us was the fact that many weapons showed the important trend toward greater mobility and greater firepower. All of them proved the continued faith in the man who will use them if war should come—the American fighting man.



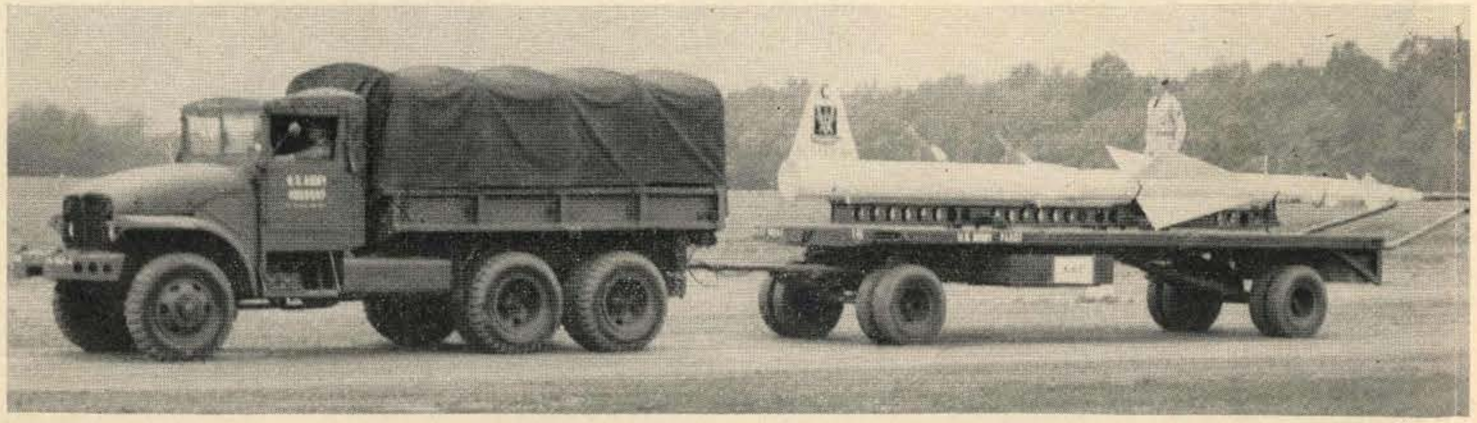
The XM274 Mechanical Mule (Carrier, light weapons, Infantry, ½-ton 4x4) is shown carrying the 106mm recoilless rifle, known as the M40A1 (BAT).



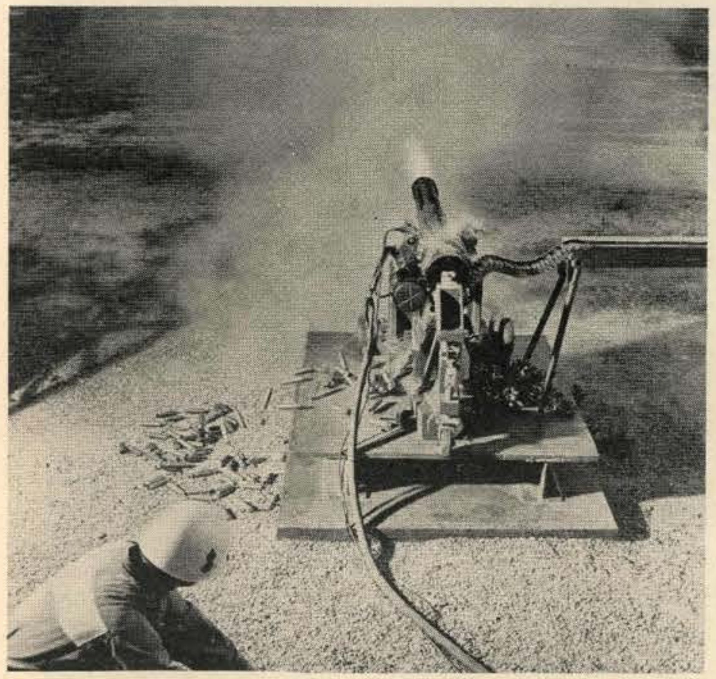
The XSSM-17 Corporal is a guided surface-to-surface artillery type missile.

The U. S. Armor Association wishes to express its thanks to the Chief of Ordnance and to the President of the American Ordnance Association for inviting us to be present at their demonstration. We salute the AOA on the occasion of its 38th Anniversary and wish them continued success in the future years of dedicated service to the National Defense of the United States.

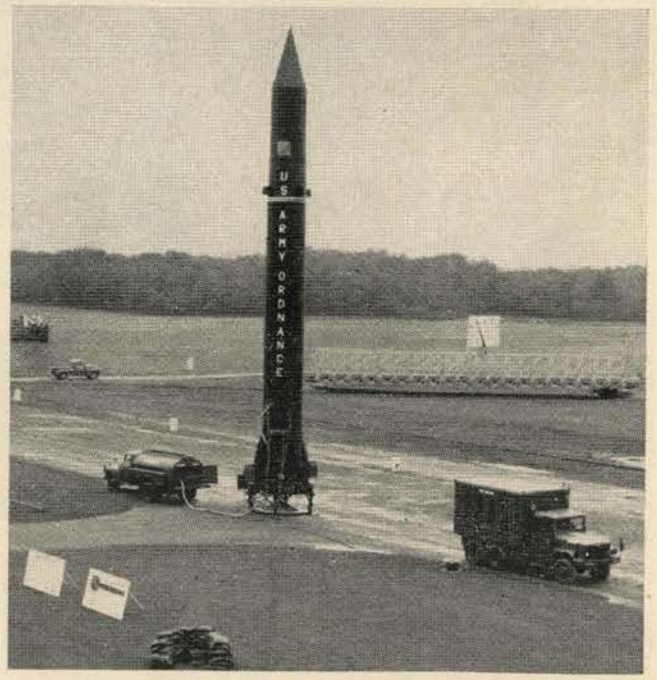
All photos U. S. Army



The XSAM-A-25 Nike is a surface-to-air guided missile, capable of seeking out and destroying high flying, high speed enemy aircraft.



The T171 Vulcan, a high velocity 20mm multi-barrel machine gun.

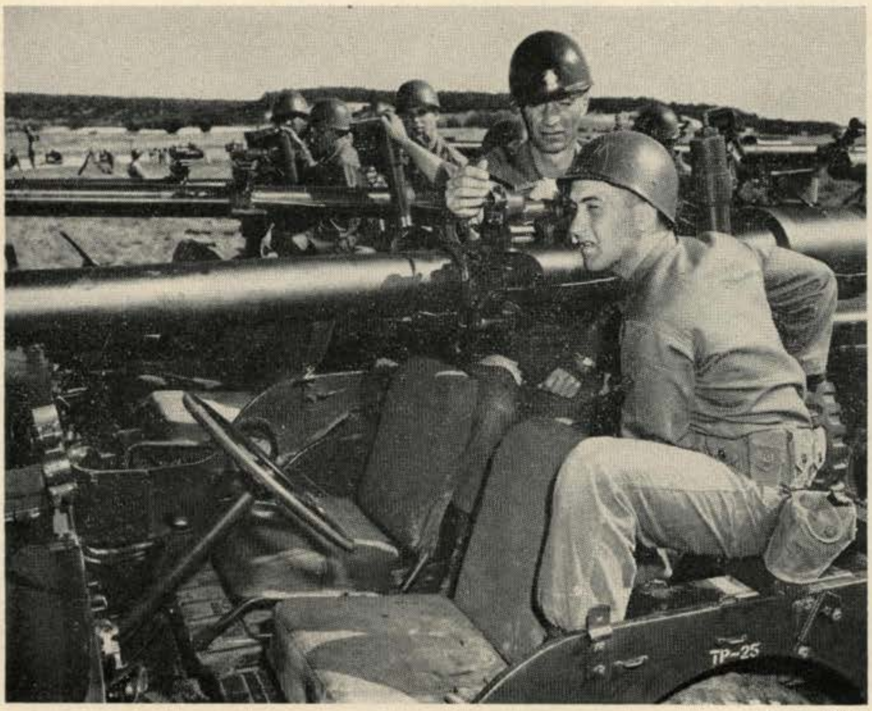


The XM5 Redstone guided missile shown in firing position.

Objections may still be raised against an antiaircraft tank, on the grounds that there will not be much use for it. It should be clear by now, however, that friendly air cover under

U. S. Army

Essentially, the antiaircraft tank is an automatic weapon vehicle and is admirably suited for supplementing and complementing the firepower of gun-tanks, or armored vehicles with other types of heavy armament.



U. S. Army

A class receiving instruction on the 105mm recoilless rifle of the Infantry.

were passed through it without a major hitch.

All plans were completed by the first of February, and on 10 February the first trainees arrived at the 4th Armored Division. They were quickly processed through the Trainee Processing Center, joined the battalions which were to be their homes during their stay at Fort Hood, and buckled down to the job in hand.

Maintenance of cadre strength soon became a major problem. In November 1955, III Corps warned the Division that in April the authorized cadre strength would be set at 38% of TO&E strength and requested that the Division submit its recommendations as to what positions by MOS be retained in the permanent party at 38% strength. This required a close, detailed study of all TO&E's to insure that positions considered critical for the instruction of trainees would be filled. Conferences were held with the commanders of the major commands and separate organizations, and a recommended 38% TO&E was finally decided upon.

The reduction of the permanent party to 38% was begun in April 1956. This was done by stopping the flow of replacements to the Division and by a series of levies against it for POR qualified personnel. Since it was necessary to maintain support units and the headquarters overhead of combat battalions at about 60% strength to furnish the necessary logistic and administrative support, the strength of qualified trainers in the companies was forced to a very low level in order for the overall strength of the Division to stay at 38%

Trainer replacements from trainees in the Division were authorized. This did not materially alter the numerical strength of trainer personnel since for every trainee retained, a POR qualified member of the permanent party had to be released to the pipeline. This exchange program has been of value, however, in that a limited number of less qualified trainer personnel were replaced by better qualified men who have helped to raise the standard of training. To date the strength problem has not been completely overcome.

This, of course, does not end the problems faced by the 4th Armored Division. As long as there are trainees, changes in tactics and policy and an Army, a unit will be faced with a never-ending array of situations. Some will be tough—some easy—all will be a challenge. While today the 4th Armored is not engaged in an actual battle with an enemy, the Division still thinks of itself as a fighting oufit, for the products of its current mission may well be called upon in the future to provide the same caliber of fighting men for which it is famous.

As one trainee remarked, "We may never fight in a war, but it won't be because we won't know how."

U. S. Army

TARGET! FIRE! It's a great feeling for the trainee when it is a direct hit.

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A SECOND LOOK AT DEFENSE BY ARMOR

By COLONEL ROBERT E. O'BRIEN, JR.

THE article by Lieutenant Colonel Kimball R. Richmond in the July-August issue of *ARMOR*, entitled "Defense by Armor," is one of great significance of a twofold nature. Not only does the article cover a broad and important aspect of Armor doctrine, but it also presents the position of The Armor School on the subject. Thus, the article merits serious attention by all of those who are interested in Armor and its development.

Colonel Richmond has done an excellent job of explaining the proposed doctrine of Armor in defense, including an entirely new type of defense. Since the article is rather short and limited to general terms, and the subject is of great importance, it is hoped that the Editor can arrange for more articles on the subject which will serve to explain further the new terms, such as "killing ground," "denial area," and the verb "pressure," and in general assist the readers in the understanding of what appears to be the first really new concept regarding Armor tactics which has been prescribed for many years. Meanwhile, examination and discussion of the proposed doctrine does not necessarily have to wait for further explanation, for Colonel Richmond has described its broad aspects with clarity, and we can undertake our examination on the basis of his presentation. Such is the purpose of this article.

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The most significant part of Colonel Richmond's article is that portion which deals with the new mobile defense, for it is rare indeed that a new doctrine is advanced. So let us take a look at this new mobile defense.

The topic sentence used to introduce the descriptive text of the new mobile defense, which presents very well the essentials thereof, reads as follows: "The basic tasks of the division conducting new mobile defense are to detect the enemy attack force, to force the enemy into a favorable killing ground, and finally to destroy the enemy by offensive action." The text then goes on to explain each of these tasks. The roles of the security and striking forces are quite conventional and thus readily understood. The pressure force is the new element. Its method of operating is described as follows: "The pressure force is organized to force, *primarily by offensive action* (italics this author's), the enemy into a favorable killing ground. The minimum combat strength competent to ensure successful accomplishment of the mission is assigned to this force. Pressure forces are assigned the following missions: to stop, slow, or repel the enemy, or to divert the enemy into selected areas."

We will delay comments on the foregoing description of the pressure force in order to review at this time just how the new mobile defense differs from the present mobile defense.

The author has summed up the present mobile defense in a succinct manner with his sentence that: "The key to this [present mobile] type of defense is basically the ability of the strongpoints to canalize and slow the enemy forces sufficiently to allow the striking force a chance to attack and destroy the enemy before he has penetrated more than an acceptable distance into our defensive zone."

Leaving out the security forces, which act the same in both types of defense, let us see how the two forms of defense differ. We see that the role of the striking force is also the same for each defense, namely to destroy by offensive action the enemy who has been canalized or diverted into a position where such is possible. The difference then is the element which does the canalizing or diverting. In the case of the *present* mobile defense, this element consists of the strongpoints, fighting primarily defensively. In the case of the *new* mobile defense, this diverting and canalizing element is the pressure force, fighting primarily offensively.

The question then is, can this pressure force be expected to succeed in its task, operating as described by the author? We are somewhat handicapped in answering this question, for the author's description of the method of operating for the pressure force, as quoted previously, is somewhat contradictory. The pressure force is described as being organized "to force, primarily by offensive action, the enemy into a favorable killing ground," and yet two sentences later the pressure force is described as being assigned missions: "to stop, slow or repel the enemy, or to divert the enemy into selected areas." These missions have the flavor of defensive action, in spite of the earlier key phrase to the effect that the pressure force acts primarily by offensive action. It must be that the former attitude is dominant, for otherwise—if the pressure force acted defensively—there would be no difference at all between the present and new mobile defense concepts and there would be no basis for placing the "new" label on the doctrine as described. Furthermore, later in his article, the author uses "pressure" as a verb in connection with the activity of the pressure force. Although "to pressure" is nowhere defined, either in the article or in the existing military dictionary (or even in any standard dictionary for that matter), it connotes offensive action.

From the foregoing it can be seen that the validity of the new mobile defense depends on the ability of the pressure force to "pressure" or force by offensive action an enemy, also on the offensive, into areas of the defender's choosing. It is here that the doctrine for the new defense as described by Colonel Richmond comes up against some harsh realities. A commander adopts the defensive for his own or a subordinate command because he is forced to do so by a stronger enemy, or because he wishes to effect an economy of force in order to employ his mass elsewhere. In either case, our side is weaker than the enemy in the area under consideration, except for the strength of its position. It would be a violation of the principle of economy of force to employ a division on the defense which is so strong that an element thereof representing "a minimum combat strength" could successfully force the attacker in a desired direction by offensive action. The defender compensates for his relative (vis-a-vis the enemy) inferior combat strength with the advantages which terrain gives to the defender. It is not a pretty picture, but the reality of the defender's situation is that he is not so strong as the enemy or else he would be an attacker—not a defender. We cannot fight the problem, much as we would like to have our defenders so strong that they might push attackers around into such positions that they are ripe for destruction by offensive action.

In addition to the unreality of the pressure force expecting to succeed in pressuring a stronger attacker, is the violation of principle that armor attacks should be massed as much as possible. If pressure forces are to attack, the attacking elements must be necessarily small, with the resultant ills which usually accompany piecemeal efforts.

Our primary objection to the new mobile defense is that it violates the fundamental principle that every tactic, whether on the offense or defense, is made up of a fixing and a maneuvering or striking action. The defensive variation embodies a holding action as the fixing action, in order to enable the maneuvering or striking force to act. This is a basic principle, and we have to live with it, although we can and must devise new and better means for its application. Certainly the article being discussed makes no effort in this direction.

The meaning of the aforementioned principle is that somewhere along the line, an element of our division is going to have to hold in order to make it possible for other elements to attack. The School in its justifiable eagerness to exploit the offensive power and mobility of Armor, appears to have glossed over this unpleasant necessity of holding—somewhere and by somebody.

Thus it appears that the proposed doctrine, as described, includes a fundamental error in not providing in uncontradicted terms for some form of holding action wherein terrain of our choosing is held until the counterattack scheme can be effected. However, as brought out earlier, analysis of the new mobile defense is made difficult by the contradictions and lack of preciseness by which the action of the pressure force is described. If we have misunderstood the method of operating of the pressure force, and the pressure force is supposed to act in a conventional manner, that is, primarily defensively, then of course the mobile defense called new is not new at all, and The School has merely stated existing doctrine in new and different terminology.

There are other indications, moreover, in the article, that the new mobile defense is not new. For one, let us turn back to Colonel Richmond's description of the current mobile defense that: "the key to this type of defense is basically the ability of the strongpoints to canalize and slow the enemy forces sufficiently to allow the striking force a chance to attack and destroy the enemy before he has penetrated more than an *acceptable* distance into the defensive zone." Can it be that the new mobile defense is new because it allows the attacker to penetrate an *unacceptable* distance into our defensive zone? This can hardly be so. The mobile defense called new allows the attacker to advance into a "killing ground" which is certainly an acceptable one, or it would not be chosen.

Another indication that our new mobile defense is in reality a description of current doctrine in different terminology is the last paragraph of Colonel Richmond's article, in which it is stated that the armored division in new mobile defense does not normally maintain a reserve. If the reader will turn to paragraph 287 of FM 100-5, Field Service Regulations—Operations, in which the mobile defense is described, he will note that neither does the current doctrine call for a reserve. The mobile defense as set forth in our fundamental doctrinal reference is composed of forward defensive positions and a striking force, with no mention of a reserve. Whether or not the striking force should be considered as a reserve is an interesting question of semantics, but we should not point to a lack of a formally designated reserve as anything new.

In summary, it is believed that the concept described in the article under review fails to face up to the realities of a defensive situation, and that exposition of the concept contains vagaries stemming from this lack of realism. By proposing an unrealistic solution for the armored division in defense, one gets the impression that Armor people are really not too keen about defense and that we prefer for others to undertake this onerous task, while Armor goes about its proper task of attacking. In so doing, we are forsaking the opportunity to present Armor as a truly versatile arm, upon which a scheme of defense can be built which is more effective on the atomic battlefield than schemes built upon an Infantry base. Armor is no longer a single purpose arm, suitable primarily for exploitation, while the steady and unrelenting task of defending and grinding holes is left to the Infantry. The modern battlefield demands mobility on defense as well as offense, and the armored division represents the most suitable type division to provide such mobility. We will examine later in this article the role of the armored division in the overall scheme, but first we will advance some ideas on how to enhance the effectiveness of the conventional mobile defense on the modern battlefield.

In its earlier parts, this article has been rather critical of the doctrine described by Colonel Richmond, for it is believed that such doctrine either contains violations of principle, or presents current doctrine in new terminology, calling the result new without justification. It is further believed that whatever errors exist in the concept of The School's new mobile defense stem from the laudable, but too eager attempt to exploit Armor's capability in the mobile role. Such an objective, to exploit those characteristics in which Armor is particularly strong, is certainly correct and proper, but it is suggested that there is more than one means for such exploitation. The School's concept of exploiting Armor's mobile capability is centered around the idea of pressure forces forcing, "primarily by offensive action," the attacker into killing grounds of our choosing. While prescribing a doctrine for defense, the accent and key actions relate to the offense, with a consequent element of unreality being injected. But there are other ways than offensive action by which Armor's mobility can be exploited. Mobility achieves its ultimate in decisiveness when applied to the exploitation phase of the offensive, but mobility can also be exploited in the conventional mobile defense. So let us examine how we can exploit Armor's characteristics in the mobile defense. In our examination, the reader is enjoined to bear in mind the problem inherent to defense that our side is the weaker with respect to the attacker. We might prefer to be on the offense, but the reality of the problem is that an enemy superior in combat strength is bearing down on our division. For the purpose of setting up a situation, we may assume that our corps commander has not pinned us down to the defense of a particular terrain feature, but has given our division a locality to defend in which there is room to maneuver. Of the three characteristics of mobility, armor-protected firepower and shock action, we will look at mobility first.

We should not have any particular difficulty in applying mobility to the action of the striking force, for by definition the striking force acts offensively, using its mobility for the purpose. With regard to the holding force, or the forward defense positions, to use FSR terminology, it too can use mobility in canalizing the attack. In this case, mobility is used in accordance with a withdrawal scheme designed to cover certain areas, leaving others more or less open to the enemy's advance. Having left certain areas open, or relatively open, to the enemy's advance, should the attacker move into such areas, he can then be attacked by our striking force.

We have avoided the term "killing ground," for the reason that it attributes to the defender a greater capability for determining the course of the action than he can logically expect. It ignores the fact that the initiative usually belongs to the attacker.

In point of fact, the concept of mobility in defense as expressed above is in line with principles laid down in the FSR. No claim for newness or originality is made, nor even of infallibility. We do not ask for infallible tactical schemes, for they do not exist; all we ask is that the scheme be realistic and hold a possibility of success if properly applied.

In organizing for defense, the holding force is built around the armored infantry battalions and the striking force around the tank battalions. The striking force will need accompanying Infantry for certain tasks, and the holding force will find tank elements necessary, not only for local counterattacks, but as fire support for the Infantry. This latter use of tanks tends to be abhorrent to the fundamentalist, for it involves the use of the tanks in a more or less static role. The fact remains, however, that the tank can be extremely effective even in a strictly defensive attitude, and such use exploits the characteristic of armor-protected firepower. Such use in the past has generally been avoided, and rightfully so, for this employment forsakes the tank's mobile characteristics. The tank has always been too expensive a piece of equipment, in terms of the effort involved in its production, support and movement to the battlefield, to do jobs which could just as well be done by antitank and Infantry weapons. When the aforementioned considerations of economy of effort are not made, however, it is generally agreed that the tank is a highly effective weapon in defense. Its protected elevated gun platform gives the tank weapons a far reaching field of observed fire. While the tank in a defensive attitude is not exploiting its capability for mobility at the moment, it is using its firepower to full advantage, and can use its mobility at the first change in the situation.

With the organization of the division and the employment of the tank as suggested above, the following picture of the holding force emerges. It would consist of strongpoint task forces generally composed of an armored infantry battalion less a company, with a tank company attached. Such organization permits formation of task forces for the striking forces heavily weighted with tanks, but with sufficient Infantry to help the tanks along. These holding force task forces are loaded with firepower, dug in, and ready to put up a stout defense to stop the attacker's onrush and hold him for varying periods of time depending on his strength. The strongpoint defends past the point that its flanks are merely threatened, and up to or even past the point that they are assailed. At this time, the task force can effect a fighting withdrawal in a direction divergent from that in which we wish the attacker to advance, and this fighting withdrawal is possible because the task force is armored. It is important that the force take advantage of its armored characteristics to delay its withdrawal past the time when its flanks are merely threatened, for it has the capability of breaking through a certain amount of flanking action.

With a basis upon which to operate, as provided by the holding force, the armored division in mobile defense can now carry out its scheme of maneuver. The attacker can be drawn into areas of our choosing, call them killing grounds if desired, by the withdrawal of the elements of the holding force in directions divergent thereto, and then the attacker can be struck by our own striking force and/or mass destruction weapons. The concept is conventional, yes, but it is viable and workable.

A more or less unconventional variation in the mobile defense can be used in which the strongpoints delay their withdrawal for a considerable period, thus accepting encirclement, in which case the withdrawal takes the form of a rearward attack. Our doctrine, as described in paragraph 284 of the FSR, is not very favorable to such a tactic, stating that "deliberate acceptance of encirclement of defended areas can be justified only if the mission warrants the sacrifice of the force or it can be assumed that relief is possible prior to its defeat"—a rather pessimistic and negative attitude toward deliberate encirclement. With the maximum of coordination and proper timing, however, encirclement could be terminated by rearward attacks as well as by the negative methods advanced by the FSR. The tactic is the ultimate in boldness and audacity, but commanders with such characteristics have worked it in the past, and can again.

In summary, it is believed that the conventional mobile defense, dynamically applied, is the proper role of the armored division in defense. So we can now turn to a brief examination of just how much can be expected of the armored division in the overall defensive scheme.

It is quite apparent from the writings in service journals, as well as current training literature (although not yet in the FSR), that dispersion is the order of the day. Dispersion cuts down the losses incurred by atomic strikes, and it is therefore necessary. So the problem is presented, how to disperse and avoid defeat in detail. Part of the answer lies in our own atomic capability to force the attacker also to disperse. But Artillery does not win battles. It supports the action of forces of primary combat, and so the remainder of the answer lies in mobility and protection; mobility to enable forces to come quickly to the aid of beleaguered forces, moving and striking so quickly that they do not present viable targets, and protection from the effects of atomic bursts. Armor, of course, has the mobility and protection to meet these requirements, so why should we not accent Armor's capability for defense in confident and realistic terms, instead of clinging to the old idea that Armor exploits while Infantry defends. On the atomic battlefield, Armor's mobility and armor-protected firepower are tailor-made to meet the demands of dispersed defense.

If proponents of Armor fail to meet the challenge of defense on the atomic battlefield with realism and enthusism, they will thus turn over this essential function to those who are eagerly attempting to respond to the challenge by other means. Right now Armor is barely holding its own, and there is a trend towards the use of vertical landing aircraft to provide the necessary mobility. There are weaknesses, however, in such a scheme, the most serious being the lack of capability to lift those items of armored equipment which provide heavy and sustained combat power and battlefield mobility. Further, airlifting presupposes a freedom from interference, that is, our own air superiority, which may or may not be the case.

Another solution to the problem concerns the provision of fleets of armored personnel carriers to transport conventional Infantry. This solution, while it amounts to a kind of tribute to the armored concept, falls short of the latter due to the lack of means to fight while moving, as represented by tank elements.

The armored division supported by atomic weapons represents the ideal means to fight a modern, hard-hitting enemy in the north European plain or any comparable, decisive field of action, bearing in mind that the great military decisions are fought out over such terrain as this. Once the barriers of an objective region have been pierced, the decisive battles must be fought in the populated and developed regions, which are trafficable to Armor as well as to the commerce which arose from the region's development. So it is incumbent upon Armor to proclaim the armored concept as the versatile concept which can defend and then go on to the decision by offensive measures.

No one has stated the problem of the defense better than Lieutenant General Gavin, in these words:

> The battle zone must be as deep as the enemy can travel with the fuel tanks of his armor full and rolling immediately after the atomic burst.
>
> We are trying to discard old concepts of linear control of the battlefield for one of area control—*a problem of controlled dispersion.*

Armor in mobile defense represents the area control and controlled dispersion cited by General Gavin. To make this point clear, the manner in which Armor conducts the mobile defense should be explained in clear, precise, and understandable terms, with reference to how accepted principles are applied. Having accomplished this much, the armored concept can be presented as the versatile concept by which a successful defense as well as offense can be conducted.

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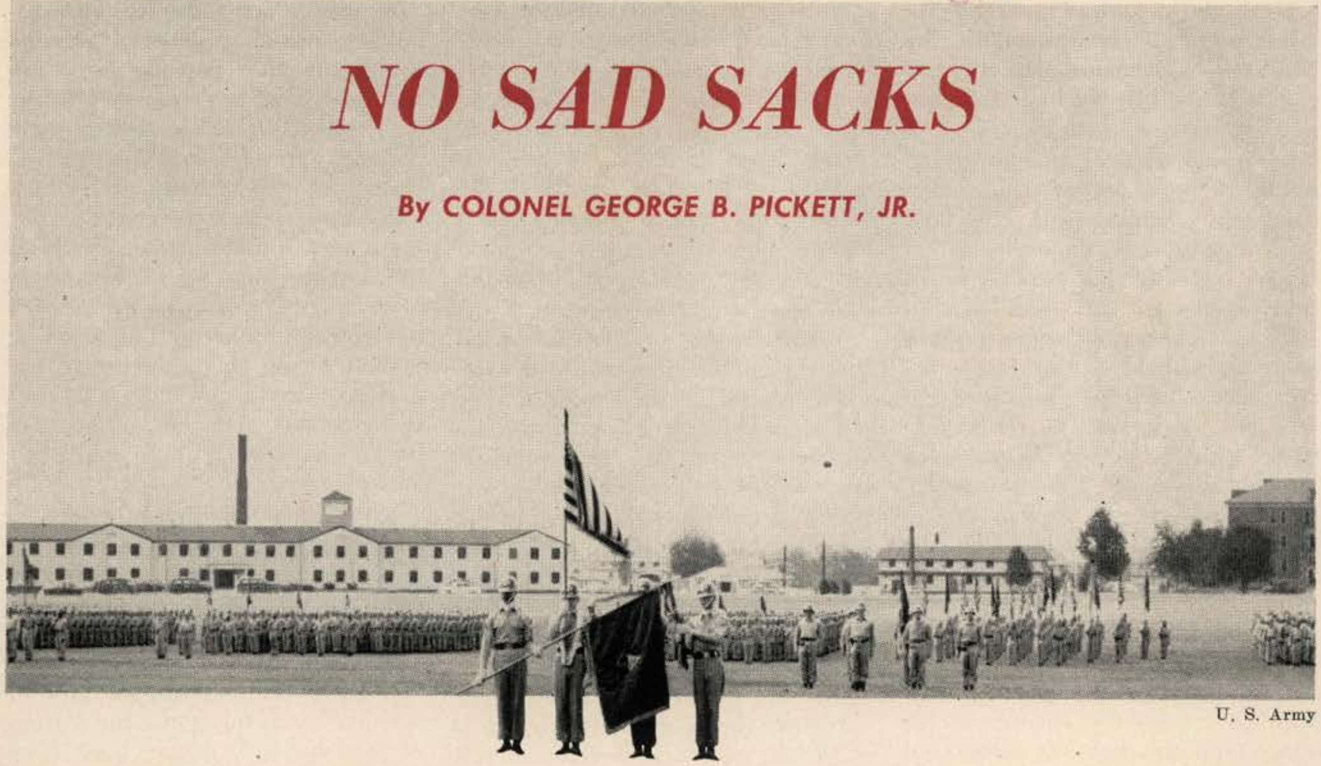
NO SAD SACKS

By COLONEL GEORGE B. PICKETT, JR.



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IF there are to be no sad sacks in an atomic war, our leadership methods need reevaluating and possibly need a major overhaul. Through custom, and justly so, every sad sack encountered on the side of the road, unshaven, dirty, always hungry, and seldom if ever informed of the situation or his task, is accepted as *prima facie* evidence of a leadership failure on the part of his Company Commander. How many of us shuddered during Command Inspections that the company moron would be the first and usually the only man that the inspecting officer would question? We were all then convinced that generals had an uncanny way of spotting our one sad sack. Of course, our job is to provide leadership of such quality that there will be no sad sacks. This can seem, in wartime, to be a superhuman task; but there are certain guide lines we can follow to make the task easier and increase our chance of success. A few such guide lines are discussed in this article.

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Never Become a Slave to a Check List

How many times have you as a unit commander been descended on by an inspection team from higher headquarters armed with a battery of check lists? You probably stood and watched the inspectors check off dull item after item, skinning you for trivia like a progress chart that had one omitted entry. Yet the check list failed to show the morale, *esprit,* and enthusiam in your command. It only skinned you for the omitted entry on a progress chart. No kind words or praise resulted from all your efforts to get the men well tailored, all the hair cut properly, and to run a mess hall in which gentlemen ate. These items do not appear on check lists. The cold, deadly, unimaginative, inflexible check list is rapidly becoming the abomination of the service. Not because we do not need check lists to keep up with the thousands of technical and administrative details in which we are engulfed; but all too often, these lists are replacing the close intimate touch and understanding essential to knowing whether your unit is an outfit with high morale and enthusiasm or just a group of people with their progress charts posted and their I & E posters current. Are your men trained? Can they shoot? Or do they have good lesson plans, keep good firing records, but can't hit the target? Or worse yet, do they "qualify" with the M1 pencil instead of the M1 rifle? A commander who takes a check list outside of his study or office is no leader; he is a pollster or at best a technician. The check list should be in his head, for knowledge is power only if you, not the check list, know the facts.

Only the Brave Deserve the Fair

Certainly a practicing coward cannot be an effective battlefield leader. This is so obvious that little need be said about it. Although each commander cannot be expected to do everything that all his men must do, he must set an example so that the men know he will demand that they do nothing he would not do himself. This does not mean having general officers command squads attacking roadblocks, unless there are no available colonels, majors, sergeants, etc. There is the well told tale of the soldiers who forced one of their officers to stay out of a fight because "we know you will do what is right but if you get it, we do not know whether we will get a captain with any brains or not." That captain reflected the ultimate in a battlefield commander. His presence was felt even when he was not in the assault echelon.

But physical courage alone is not the only requirement. Moral courage today is in far greater demand. How many really capable officers have had their careers sabotaged because they put the strength of their convictions ahead of grins, smiles and diplomatic fiddle faddle designed to get a good efficiency report? When you are convinced you are right, stick by your conviction until the decision is made; then back that decision as if you had never questioned it. We have heard this many times but too often in today's service we see officers bending with every wind, the wind of course being the implied view of the rating officer.

It also takes courage to force your men to live by the desired code and moral standards when they see Charlie Company next door raising hell without restraint. Of course, you yourself must avoid the old accusation of "Do what I say, not what I do." Personal example still remains a paramount factor in anyone's concept of leadership. With the increased dispersion required on an atomic battlefield, control and supervision become difficult. You must be able to depend on your subordinates. Most of them will follow your personal example.

Speak Forcefully and Clearly

Have you ever seen an evangelist worth his salt who was not a clear and forceful speaker? Watch his audience react to his every phrase, see the enthusiasm and emotional charge to follow his advice as they depart from the meeting place. Now compare this to some field officer who calls everyone together to brief them on "Plan A." The odds are 5 to 2 that he mumbles, or reads them his notes with no "eye to eye" or "person to person" contact. They fidget, doodle, and soon begin to wonder when the restriction on parking at the officers' mess will end. A good forceful and clear speaker could orient the group in one-half the time and have them leave with a clear idea of what was wanted and a firm desire to do it. How many briefings and conferences have you attended where, after they ended, you left in more of a haze on the subject than when you entered? There was a day when the old adage was "don't let yourself get known as a good speaker, general X thinks good speakers are slick talkers and don't get anything done." Bosh and twiddle; you certainly cannot get anything done if you cannot impart the facts and your desires in a clear manner and with enough zest to instill enthusiasm in your subordinates to do their best. You cannot force their best effort; you can command compliance but that touch of genius that each of our subordinates has within him can only be fired up by getting to him. A forceful speaker has a real advantage,

Always Consider Your Men First

Many of us have seen enemy officers, well fed, clean, neat, polished, shaven, come into our lines to surrender. More times than not, they were accompanied by their striker. This was always a good omen because it meant the poor, dirty, hungry, and tired enemy soldiers would quit easily when we attacked the next day.

Now contrast this with the situation of one of our tank company commanders in Korea who shared his own winter gloves with a lefthanded man in his company so each could eat in the chow line. When the troops know that you consider their needs and will satisfy them, your problem is a good way on the road to solution. Some people call this the "father image of the leader." To explain the principle, we must realize that most of our men are fairly young when we get them. If they had parental support and supervision, your problem is also partially solved because, subconsciously, the new soldier looks about for someone to replace the authority and bear the responsibility formerly borne by his father. That is why we should be dead set against *battalion* messes, *battalion* instead of *company* supply, and *battalion* instead of *company* punishment. The soldier looks at his "father image" to feed, clothe, pay, and punish him. He can see a company commander—the captain is a real, actual person he can see and who knows him and sees him. This intimate contact is lost when the battalion commander replaces the company commander as the "father image." When the soldier has no intimate contact with authority and the man responsible for him, he becomes frustrated, and soon is a behavior problem. Of course this is a greatly oversimplified but true in principle explanation. The converse is also true. If the lad hated his father he will probably be rebellious against his captain—the "father image." Do not look on your men as your children but remember that subconsciously many of them expect you to replace the responsibility for them and authority of their parents, especially the younger ones. If you consider your responsibility in that light, you cannot fail to provide for them first; it is instinctive.

Don't Become a Harping Critic or Faddist

Have you ever seen a monument to a critic? In all of Washington, the only monuments are to doers. Doers are the makers of progress but the victims of critics. Being a constant harping critic soon indicates that you are not a doer. Critics really have no ideas or opinions; they never know exactly what they do like, only what they do not like. You must like something or believe in something to accomplish anything. There is an old gag "Sure his OEI is high; he never made a mistake, of course he never has really done anything either." The object of that remark was probably an excellent critic. So adept was he that his OEI was high, probably at the expense of the doers. This idea of constantly criticizing comes from a basic sense of inferiority and a desire to see no one else succeed. Become a recognized and constant critic and you are merely advertising your hidden inferiority feelings. How many music critics can compose some piece like the Polonaise? When you are a doer, be damned to your critics!

Now we encounter the faddist; and here is a real problem. He generally works from an absolutist base. "All men who aren't expert riflemen are worthless" is one of his typical responses. He surrounds himself with "expert riflemen." He approves only

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Have you ever seen a monument like this to a critic?

"expert riflemen" for key jobs. If he attains sufficient rank, only "expert riflemen" or "combat infantrymen" or some similar cult become qualified for higher rank. He may become a "run five miles before breakfast" fanatic. "Only men who can run five miles before breakfast can qualify for command or staff assignments in my units." Humorous? Stop and think how many absurdities of this type you have already encountered. Some faddists also believe that only the "X" weapons system wins wars; all of you other people are just here to support the "X" weapons system. (We include the man with the rifle as being a weapons system as well as the tank, artillery piece, atomic warhead, B52, parachutist with a rifle, etc.)

Physical exercise fads can be very dangerous. Not one of us can do an effective job of leadership with a fat, flabby body. Physical exertion in desk jobs certainly is not enough to keep us in sufficient physical condition to be dynamic leaders. It therefore behooves each of us to keep ourselves fit, for we alone know our real condition. However, beware of faddism! This area of activity alone produces its share of faddists. Don't overdo your program by setting up requirements for your men that your surgeon knows are more harmful than helpful. Remember "a 5 mile run daily" or "golf in the 80's" or "weight lifting" may not be the solution at all. In fact it may be only a fad with you and make you open to ridicule, which lowers your leadership potential. Physical fitness programs must be carefully planned and coordinated with your surgeon. Two harmful physical "tests" a year may not be the answer either. Give your men time to get in shape. The opposite of being a physical faddist is complete neglect. Both are equally reprehensible conduct for a responsible leader.

Another sad faddist is the one who emulates someone else. "Napoleon" emulators, the swaggering "Jeb Stuarts" and other "types" actually have so little real faith in themselves that they must copy an "accepted" personality. Each uses the "emulatee's" personality as a crutch for his own inferior personality. Do not be an "emulator" as a means of gaining pseudo-prestige. It marks you as having inferiority feelings and needing a personality crutch. Now do not get the idea that you must not emulate their thoughts or deeds; just do not try to dress, look, and act like the personality. For example, do not run around with a plume in your hat to let everyone know you are a "Stuart." These examples are ancient; pick the recent ones from your own experience.

Strict Loyalty to Subordinates

We owe loyalty to our subordinates in the same degree that we expect it from them. To be sure we do not let them down, we should go a little bit further in loyalty downward than we would expect from them. Overdo this by choice. It will pay off. When a man works hard for you, retribution will eventually catch up with you if you knife him in the back. Oh, you can ruin a good man's OEI out of jealousy or personal dislike, but you will be tabbed as a petty and a "not to be served under if I can avoid it" type. You lose in the end; if you think a man is not measuring up, tell him, but do not take it out on him in an efficiency report that you never show him, or even worse, give him the impression that he is pleasing you and then ruin him. You do not have to like him, but you do have to be a man. Your loyalty should go so far as to see that he gets prompt and adequate recognition for his praiseworthy activity. Too often there is a tendency to take credit for something one of our indians is directly responsible for. Credit snatching is not conducive to obtaining inspired work from others. Do not play down a good man just to keep someone else from stealing him out from under you. This also does him a great injustice. If you cannot do unto him as you would have him do unto you, at least do not do unto him what you would not want him to do unto you. If your personalities clash, go to your superior and request transfer of the man without prejudice. In short, your moral integrity is displayed to a large degree by the manner in which you treat your indians. Your boss notices it too. There is an old saying "Those who live by the sword die by the sword." A modern interpretation can be "Those who knife in the back sooner or later get knifed in the back." In short, the secret of dealing with subordinates is just plain having good human relations. Seniority does not endow you with a god-like status.

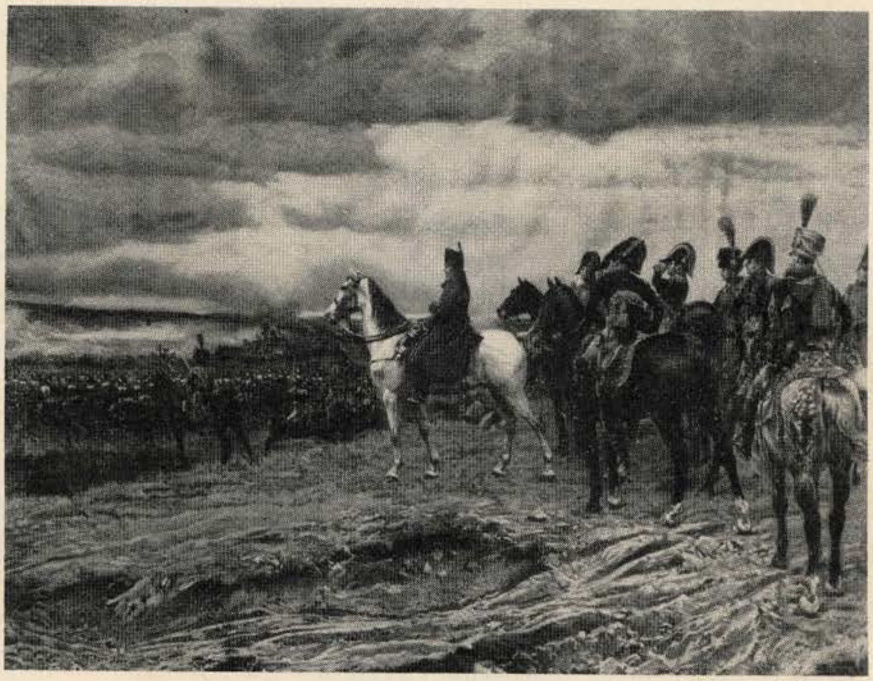
Assist Your Subordinates to Develop

In atomic war, decisive engagements will consist of a series of small unit actions over a wide area. The responsibility for victory will rest in each case on the Captain or Lieutenant Colonel in command. A series of these fights determines the outcome of the operation. Ground combat is becoming a Captain's and to a lesser extent a Major's and Lieutenant Colonel's war. Our job as leaders is to produce a system of leadership and command wherein these ranks—and the Lieutenants who will be in those ranks in event of emergency—are given an opportunity to develop during normal peacetime duty and training. This can be done only by giving them ample opportunity to act and to think for themselves. This is not accomplished by constant "over supervision" during their normal duties. Look more for "end products" and "results" than for adherence to how you used to do it. There are more ways than one to run a mess hall, several excellent ways in fact so your "one" way certainly isn't the solution to inspiring initiative in subordinates.

This problem stems from the overstaffing in many cases of higher headquarters. Inspectors in droves descend on small and medium (Co and Bn) commanders with batteries of check lists. Rigidity to rote and fixed methods result from fear of these unimaginative inspectors and their check lists. For example, instead of checking for charts being posted, initiative in junior officers would be enhanced if the inspector asked questions to determine if the men were up to the desired point in their training. The chart is a means, not an end. A system of leadership based on "ends" not "means" is best in developing leaders for atomic war. Remember when an officer's efficiency is measured in how well he follows fixed schedules and dogmas of higher headquarters, and this is the dominant requirement, then his initiative is being stifled and his value as a battlefield leader in an atomic war is not being developed. Naturally the higher commander wants to make his personality felt in his command but he must be careful to obtain a happy medium and not produce officers who do only what he says and are not capable of independent action when the decision rests with them alone.

Creative Thinking Wins Wars

Ideas shape the world today and spell the future of things to come. Too often we fail to realize that one good idea is worth a thousand value judgments on an old dead horse or someone else's idea. Napoleon had a terrific creative imagination so he won battles. Edison had a gigantic idea capacity; Edison became the foremost inventor of his age. Einstein had creative talent. The list is legion: Bedford Forrest, Grant, von Moltke, Ludendorff, Charles Kettering and Joe Smith. For Joe Smith is a fellow like you and me. As a battalion commander in 1945-46 in Germany, he did not sit back and howl about no billets for his men, no recreation, VD rates, accident rates, etc. Instead he used his creative imagination plus initiative to solve these problems. Sure there were not enough engineers to build the Red Cross Club in Dopelburg in 1945; but it was built. Sure there was no system or means of repairing the Kavalrie Kasern to make it tenable; but it became tenable and the men were well taken care of during the winter of 1945-46. While some commanders became harping critics, others acted. Creative thinking plus initiative is an unbeatable combination. Opinions are not valuable unless constructive; but even a constructive opinion had its roots in someone else's original thought. If you have a talent for creative thinking, fine; if not, get a good creative thinker for one of your staff. Appreciate him; for any act of near genius on your part will probably come from his imagination. We can all develop our imaginations by various mental exercises and by avoiding becoming critics; but let's face it,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Imagination and enthusiasm helped win his battles.

some men are more creative than others. Our job as leaders is to appreciate and employ the "idea" man to his maximum. The word "exploit" was not used so don't steal his ideas; get him recognition if he earns it. Creative thinking on the battlefield pays off. Von Hutier himself thought up and developed infiltration and soft spot tactics for the highly successful Riga operation in 1917. Napoleon once won a battle by sending buglers to sound "The charge" in rear of his Austrian enemies. He had no troops left to send there; but his idea of scaring his foe with a bugle call in their rear won him a victory. The hedgerow cutters for tanks in Normandy was an idea that paid big dividends. Many people feel that a large part of the success in extricating IX Corps from the Chong Chong River in November 1950 had its origin in the creative thinking of a Colonel named William B. Kunzig. There was nothing to be gained by sitting back and being a critic, so Colonel Kunzig thought it out. There were those who did not.

Knowledge is Power

Knowledge is power. How often have we heard that one. Know more than your men to earn their respect. Can we do that today? Can one man know everything his radioman, radarman, mechanic, electrician and computer knows? The answer is obvious: No. We do not need to be technicians to be commanders. The great crime of our decade is not the glorification of the technician but his glorification at the expense of the leaders who retain responsibility for all that their command does or fails to do including the technicians!

We must know our jobs well. Our jobs are command or staff or instructing or whatever they may be; but regardless, let's know our job. Later, we can learn the highlights of the technicians' jobs in order to supervise these *nouveau riche a*dequately. Did you realize that the dentist on the USS Missouri, the world's largest battleship, probably is paid more than the ship's captain? Does the captain also have to know how to fill teeth? No, but he has to know whether or not the dentist is doing his job.

A leader's job is to know how to get the most out of his men and equipment. The detailed knowledge depends to a great extent on local conditions. For example, if the tank maintenance is poor, an Armored Division commander has the choice of immediately sacking the maintenance officer or boning up on tank maintenance in order to see where the real problems lie. Naturally the maintenance officer gets his lumps but often enough we find that the maintenance officer had been reporting the facts and causes and even pleading with the Chief of Staff or CG himself but these two did not appreciate the problem until they boned up on it. Just what to bone up on and when to do it is your problem. In a routine assignment it may be obvious. In a top command job it requires thought and analysis.

Stay Enthusiastic and Aggressive

Aggressiveness is both a curse and a virtue. In a battlefield commander it is the desired trait, whereas in a Pentagon paper shuffler it may result in frustration and ulcers. But aggressiveness is not a trait that can be turned off and on with a lever or faucet. If a man is aggressive he normally stays that way. In combat when we say "This man is aggressive" we say it with pride. In peacetime too many of our "diplomatic" or "popularity" seeker commanders say it with scorn. But remember this, an aggressive officer, even shuffling papers, will get the job done. He may step on a few toes; bue he gets the job done. The "diplomat" may; you cannot be sure. The remark "This man has tact and diplomacy" may mean that he also has no aggressiveness, enthusiasm, or convictions because tact and the others mentioned are basically incompatible characteristics. The remark "Colonel Silent is strong, a deep thinker" too often hides the fact that he is only smart enough to know that if he opens his mouth his stupidity will show. When an officer is sent to represent his chief at a conference and never opens his mouth, either pro or con, is he doing his job well? Stay enthusiastic and aggressive; three officers of that type will succeed for every "diplomat," or "Army politician." Enthusiasm is contagious; but a half-hearted and nervous commander rarely produces an aggressive battlefield command.

Finis

The purpose of this article is not to inspire you with the great deeds of those long or recently dead; nor even to advise you to emulate anyone, but to show you leadership problems that exist today in order that you can proudly say your outfit has no sad sacks, as well as keeping you from being one yourself.

ABIDE BY THESE RULES AND YOU WILL HAVE NO SAD SACKS IN YOUR OUTFIT!

N—never become a slave to a check list
O—only the brave deserve the fair (breaks)

S—speaking clearly and forcefully is a great aid
A—always consider your men first
D—don't be a harping critic or faddist

S—strict loyalty is due to your subordinates
A—assist your subordinates to develop
C—creative thinking wins wars
K—knowledge is power
S—stay enthusiastic and aggressive

CARDED

all conditions and in every place cannot be taken for granted and it can never be guaranteed. There is, therefore, more than sufficient reason for development of antiaircraft tanks.

THE ANTIAIRCRAFT TANK

By *RICHARD M. OGORKIEWICZ*

THE problem of antiaircraft defense of armored units has been considered, on and off, throughout most of the life of armor. More often than not, however, the amount of attention given to it has been small, as it is at present. Yet there is no guarantee that the problem will not arise again in a much more acute form than ever before. Indeed, the chances are that it may well do so.

That relatively little attention was given to antiaircraft defense in the early stages of tank development is not surprising: when the standard armament of attacking aircraft consisted of rifle caliber machine guns and 20 or 30 pound bombs, the threat to tanks was negligible.

It is true that as a result of a few attacks by German planes against British tanks in World War I some attention was given to the problem in the immediate post-war period. For instance, British tanks designed immediately after the war, such as the little known Vickers Tank No. 2 and the much better known Vickers Mediums, incorporated a ball-mounted Hotchkiss machine gun in the turret roof, to be fired from within the tank at attacking aircraft. But the concern was based on a potential rather than an actual air threat; it was really premature and the measure adopted was more in the nature of a gesture than anything else.

A more practical approach was adopted in the late twenties when the first antiaircraft tank was built, again in England. It consisted of two .50 Vickers water cooled machine guns on a modified Light Tank Mark I (Carden Loyd Mark VIII). There was, however, still little incentive to develop this type of vehicle, attention being directed more toward the problem of antiaircraft defense of various unarmored vehicular columns cooperating with tank units rather than tank units themselves. Even in the first year of World War II General Guderian could write suggesting that the tank was the safest place on the battlefield, so far as air attacks were concerned.

The Air Threat

By the early stages of World War II, however, the situation was beginning to change. The air threat to all motorized columns, which formed—and still do—the bulk of all mechanized formations, was already real and considerable. By the late thirties the technique of ground air attack had made considerable progress and led to the creation of a number of special air units, such as the "attack squadrons" of the U. S. Army Air Corps, the "assault squadrons" of the Italian *Regia Aeronautica,* the French *l'aviation d'assault* and the *Sturmkampfflugzeuge* of the German *Luftwaffe.*

Some of the potentialities of these tactical air units already had been demonstrated during the Spanish Civil War, notably in low level attacks against motorized transport columns. German Junkers Ju87 *Stuka* dive-bombers also made their debut in Spain, before becoming would-famous by their exploits in all the early *Blitzkrieg* campaigns of World War II. Their action too was mainly effective against transport columns and troop positions—one of the most spectacular examples of the former being the destruction of the fuel supply trains of the 1st French Armored Division in May 1940, which led to the immobilization and destruction of that organization. Material damage inflicted directly on tank units was small, though the moral effect was often considerable.

On the Allied side in the 1940 campaign, the French claimed successful employment of their 20mm cannon armed fighters against German armored vehicles. But a year or so later, in the Libyan Desert, the Royal Air Force found that its Hawker *Hurricane* fighters, which had just been rearmed with 20mm cannon, were ineffective against tanks—though, once again, they were highly effective against all soft-skinned transport. Like dive-bombers, fighters-bombers were not effective against individual armored vehicles and were used chiefly against troop positions, concentrations and transport.

The first direct threat to tanks did not come until 1942, when heavier guns were mounted in aircraft, leading to such ground attack models as the British *Hurricane IID* with two 40mm guns, and the German Henschel 129 with a long 30mm gun and the modified Ju87 with two 37mm guns. The first scored a few successes in the closing stages of the war in North Africa and the other two a

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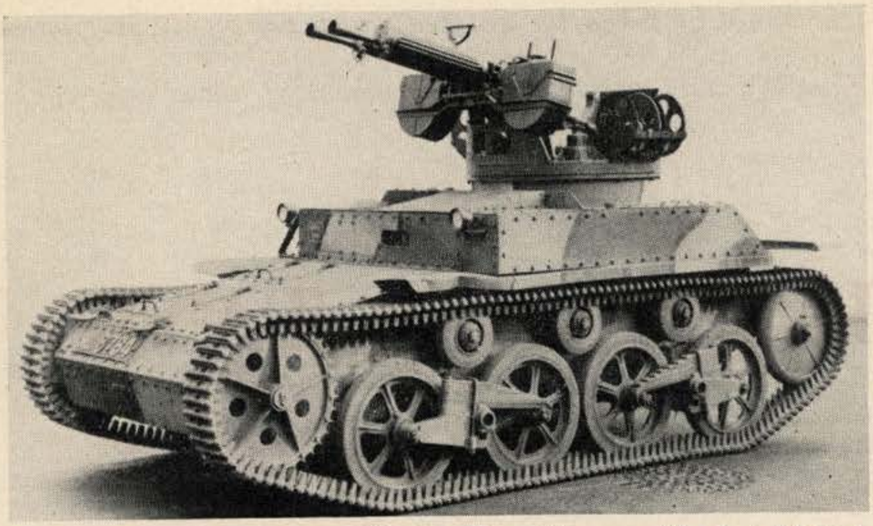


A Vickers Carden Loyd Mark VIII with .50 machine guns: The first AA tank.

few more against Soviet tanks on the Eastern Front.

On the whole, however, this type of aircraft did not prove very successful. One of the main reasons was that the requirement of a fairly heavy type of gun turned it into a limited-purpose aircraft which fell easy prey to enemy fighter planes. The heavy gun aircraft ultimately found better employment in naval operations, as shown by the British de Havilland *Mosquito* armed with a 57mm gun and the successes of the North American B25 with a 75mm gun against Japanese shipping.

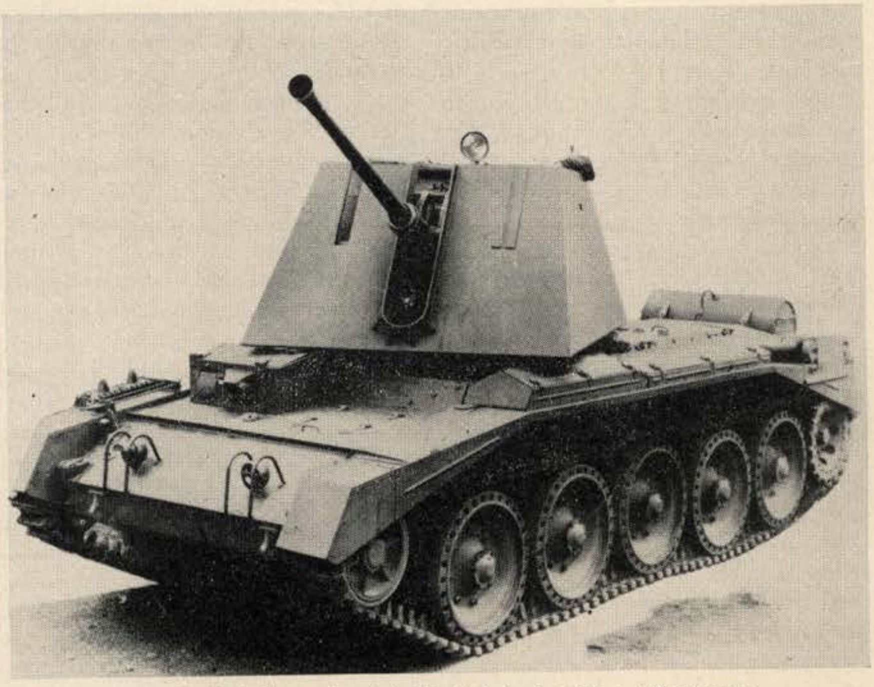
It was not until the introduction of rockets that a really effective airborne antitank weapon was found. The rocket provided the heavy and yet relatively accurate weapon which made aircraft capable of attacking individual tanks, as well as other ground targets, with a reasonable chance of scoring a hit.

One of the very first fighters to be equipped with rockets was the British Hawker *Typhoon.* Armed with 60 lb semi-armor-piercing rockets, it saw extensive use in Normandy and Northeast Europe with a good measure of success. However, the losses inflicted in what was at the time claimed to be the greatest success of the rocket firing fighters—the destruction of German tanks in the final German counterattack in the Mortain Pocket, Normandy, in August 1944—proved to be, in after-battle analysis, due largely to ground fire!

Another form of air attack also proved effective against tank units in Normandy, having been first tried in Tunisia in 1943, namely the "carpet bombing" technique of Allied heavy bomber formations. By multiplying the number of bombs per acre of real estate, it could not help, by the simple laws of probability, scoring a number of direct hits as well as disrupting and stunning the organization of the troops under attack. The fate of the German *Panzer Lehr* armored division at St. Lo in July, 1944, which had about 70 per cent of its effectives knocked out in one such attack, has provided ample testimony of its effectiveness.

Since then this form of air attack has not been tried against armored formations and probably will not be tried again in view of the altered conditions of aerial warfare. The place of mass bombing raids has been taken by the bomber with the atom bomb and the atomic missiles but the serious problems which these raise are outside the realm of antiaircraft defense of individual tanks or small tank units.

Rockets have, however, been used against tanks since World War II—in Korea. Their precise effectiveness there has been difficult to assess, on account of disagreements as to the precise amount of damage inflicted, the initial absence of hostile antiaircraft and the almost continuous absence of hostile fighters over the front line. There is little doubt that the success of the rocket firing fighter has been exaggerated on a number of occasions and that it has not spelt the doom of the tank any more than the much vaunted Bell P39, or the Soviet *Stormovik,* or any of the other so-called "tank busters" of World War II. Rocket armed fighters have, however, shown that aircraft are capable of inflicting serious casualties not only on unarmored but also on armored units, particularly in the absence of friendly air cover and effective ground antiaircraft. Close defense of tank units is, therefore, something which



The British Crusader AA Mark I tank with a 40mm gun.

can no longer be ignored—particularly in face of a potential enemy with strong tactical air forces.

Counter-measures

Seventeen years ago, on the eve of World War II, antiaircraft defense of armored units was almost entirely concerned with the protection of transport columns. For this, attached towed antiaircraft artillery units at divisional level were considered adequate, supplemented by a few self-propelled weapons such as the German half-track mounted 20mm cannon or the quadruple Soviet Maxim machine guns on trucks. Here and there a few light machine guns were affixed to the outside of tank turrets, more for moral effect than anything else.

The first drastic change in this situation was brought about by the success of the German *Stukas* in the Polish and French campaigns of 1939 and 1940. Their considerable moral and material effect on all opposing arms and occasional hits on tanks revived in Britain the development of the antiaircraft tank. The first of the series consisted of a special turret with four 7.92mm Besa machine guns on the Light Tank Mark VI, and this became the first antiaircraft tank to be permanently incorporated within the framework of armored units, four being allotted after 1941 to the headquarters squadron (company) of each British armored battalion.

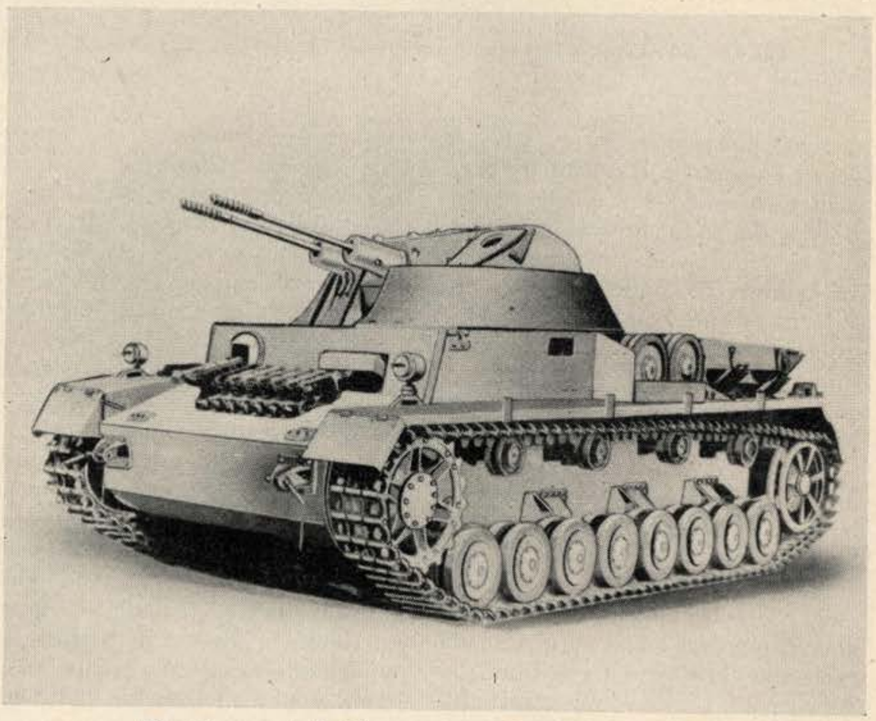
This first antiaircraft model saw some service in the Western Desert in Africa and was followed by considerably improved types such as the AA Tank Mark I with a single 40mm Bofors and the AA Mark II and III with twin 20mm Polsten cannon, all based on the *Crusader* cruiser tank chassis. In 1943 the last two became the standard equipment of British armored units, there being six or even eight Mark IIs or IIIs to each tank battalion.

By then, however, the menace of the German dive bombers was virtually over. With the passing of air superiority into Allied hands it was the turn of the Germans to be harassed from the air. They began to experience it on the Eastern Front and, in a much more intensive form, in Africa from the Royal Air Force's Hawker *Hurricane* and U.S.-built Curtiss P40 *Kittyhawk* fighter-bombers. It was now their turn to take up the development of antiaircraft tanks, as well as increasing the number of various towed and self-propelled antiaircraft guns—particularly multiple 20mm cannon—and armoring their half-track carriages.

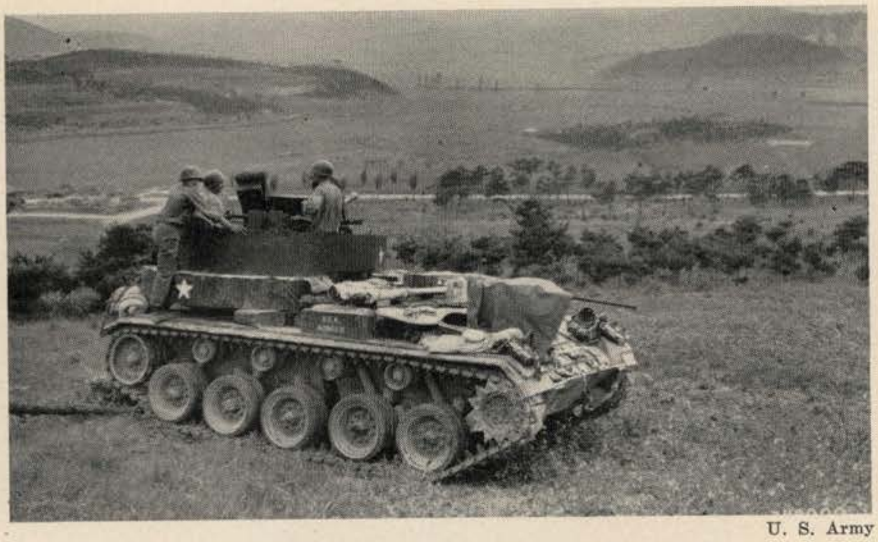
The winter of 1943-44 saw the appearance of the first fully tracked *Flakpanzer:* the light *Flakpanzer 38t* based on the ubiquitous Czech-built 38t chassis, the *Wirbelwind* (Whirlwind) with quadruple 20mm cannon on the Pz.Kpfw.IV medium tank chassis and the *Mobelwagen* (Furniture Van) with a single 37mm gun on the same chassis. They were not before their time, and not long afterwards the need for them became almost desperate, when Allied armies landed on the continent of Europe accompanied by massive air strikes and swarms of rocket firing fighters and fighter-bombers. How serious the effect of British and American fighter attacks was can best be gauged from the proposal made by the Inspector of Panzer Troops in France soon after D-Day that one out of three tank battalions in each *Panzer* division be made a *Flakpanzer* battalion!

As it was, the best that could be done under the pressure of various demands on German productive capacity was an antiaircraft tank platoon with three to eight AA tanks in the tank battalion and tank regiment headquarters companies.

Development of further and improved AA tanks was similarly hampered by inadequate industrial resources. In 1944, however, a new type was brought out, the *Kugelblitz* (Ball Lightning), with two 30mm automatic cannon in a fully enclosed power operated turret mounted on the Pz.-Kpfw.IV chassis. But this was only an interim solution, pending the development of similar equipment on the lighter, diesel-powered *Panzerjaeger 38d* chassis. The latter was intended to be the standard light antiaircraft tank and at the same time a heavy 88mm antiaircraft was being developed on the Panther medium tank chassis.


The German twin 30mm cannon Kugelblitz AA tank.

The Panther AA tank was a logical outcome of the widespread dual-purpose employment of 88mm guns by the German Army and was further necessitated by the medium and high level attacks by British and American bomber formations, which were outside the range of lighter weapons and which could roam unopposed in the absence of any serious *Luftwaffe* fighter opposition over the battlefield.



U. S. Army

The United States M19 twin 40mm on the Light Tank M24 chassis.

A somewhat similar heavy self-propelled antiaircraft had actually been built earlier by the Canadians: the 3.7inch gun on the Ram medium tank chassis. Earlier still came the British 18 pounder (83.8mm) gun on the Vickers medium tank chassis. This truly remarkable vehicle of the mid-twenties, capable of field artillery, antitank and antiaircraft employment, would have bestowed a tremendous advantage on British armored forces in the early stages of World War II had its development not been unwisely abandoned.

However, by the time the development of the heavy self-propelled antiaircraft gun was taken up in Canada there was little need for it from the Allied point of view. Air superiority over the battlefields passed firmly into Allied hands and any German bombers which might have tried to put in an appearance could be dealt with by Allied fighters. In the future there is going to be even less need for this type as medium and high level bombers not dealt with by friendly fighters are going to be tackled by ground-to-air guided missiles.

United States Antiaircraft

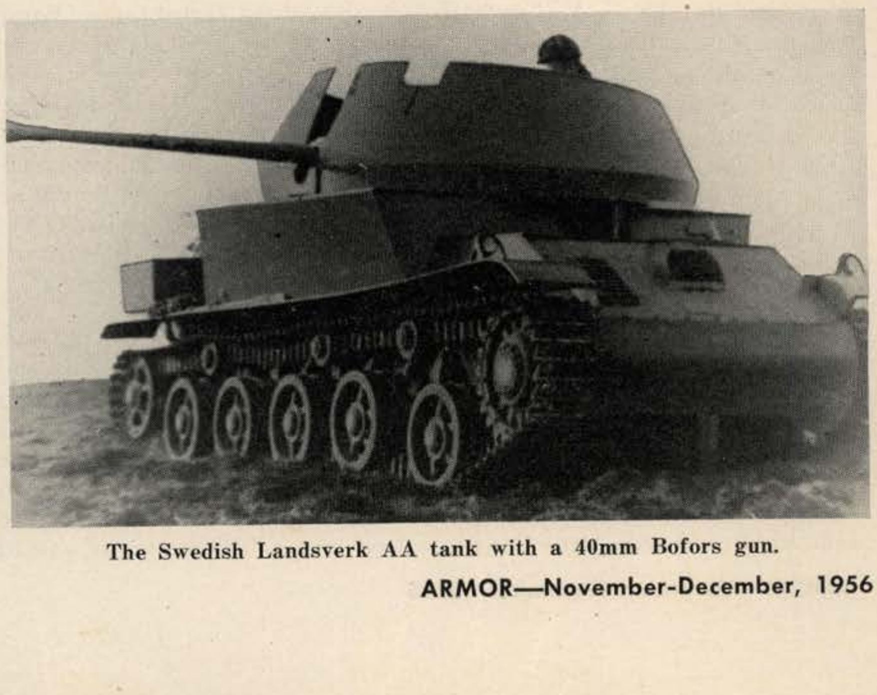
By and large, when Allied forces landed on the continent of Europe in 1944, and armored forces went into large scale action, hostile bomber forces were virtually non-existent and the problem of antiaircraft defense reduced itself largely to that of occasional attacks by fighter-bombers.

In the United States armored formations, then as now, antiaircraft weapons were handled by the Antiaircraft Artillery Automatic Weapons Battalions at divisional level. Unlike the British and German, American tank units have had no antiaircraft tanks and the only organic antiaircraft weapons have been single 50 caliber machine guns mounted on tank turrets—a method of antiaircraft defense of very questionable efficiency and one not favored by other armies.

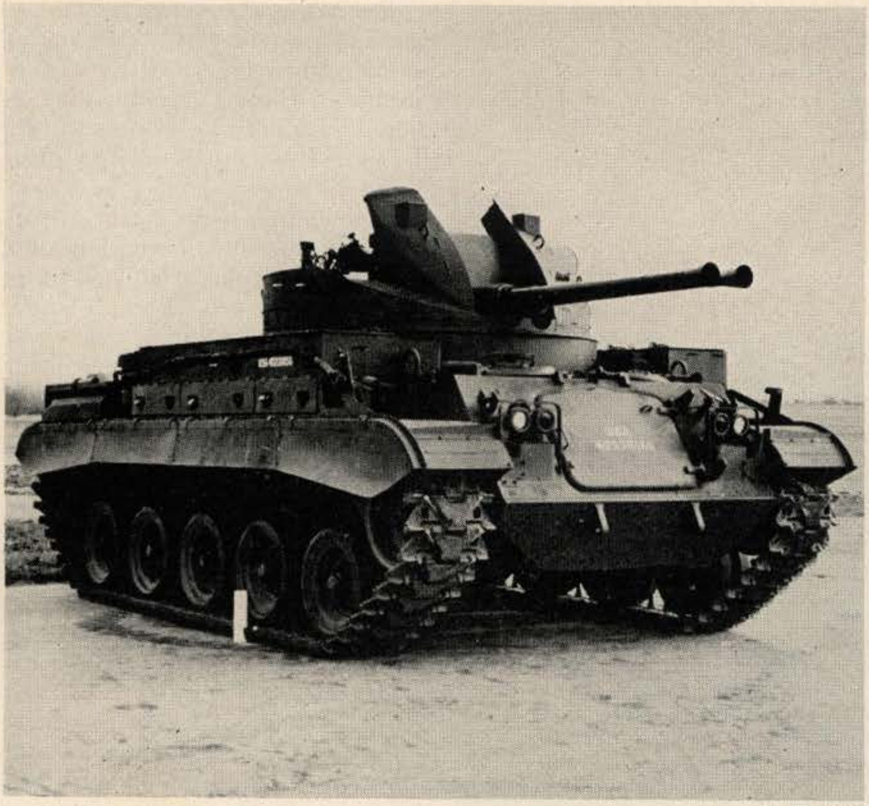
The only fully tracked self-propelled antiaircraft weapon to appear in action before the end of World War II was the twin 40mm M19 on the Light Tank M24 chassis. This type, like the Bofors designed 40mm gun itself, originated in Sweden in the late thirties in the shape of a 40mm gun on a Landsverk light tank chassis which has since been superseded by the still current twin 40mm LVKV41.

In the United States a number of experimental antiaircraft tanks were built in the early forties, including the twin 50 caliber on the M3 light tank chassis, the single 40mm T36 and T52 on the M4 medium tank chassis and the sextuple 50 caliber T77 on the M24 chassis. The Canadians also built a few specimen of the *Skink* antiaircraft tank on the M4 chassis, replacing the normal turret by a special one with four 20mm Polsten cannon. However, apart from the M19 and the recent twin 40mm M42, the only antiaircraft vehicles in regular service were the half-track multiple gun carriages, such as the M15 and M16. Their design dates back to 1941 and their origin can be traced back even further for they were preceded by a French twin 13mm machine gun on the Citroen-Kegresse half-track of the mid-thirties and the German multiple 20mm cannon half-track installations.

That comparatively little progress has been made in the direction of antiaircraft tanks in the United States must be ascribed to a lack of incentive in the shape of a strong and effective hostile tactical air force at the time that the U. S. armored forces have been in action. This also explains the fade-out of British antiaircraft tanks toward the end of World War II and the relative lack of interest on the part of the Soviet Army. The self-propelled antiaircraft which



The Swedish Landsverk AA tank with a 40mm Bofors gun.



U. S. Army

The United States M42 twin 40mm gun on the M41 tank chassis.

the latter produced toward the end of war, a 37mm gun on the S.U.76 chassis, was hardly an improvement on some of the earliest German *Flakpanzers.*

A Lesson for the Future

The war in Korea has provided even less experience or incentive than the closing stages of World War II, for the U. S. Air Force ruled the skies over the battlefield. This happy state of affairs may not, however, always apply. The chances are, in fact, that in the case of a major conflict in the future the air forces of the Western Allies will be heavily outnumbered. It would be foolish, anyway, to take the quantitative or qualitative superiority of friendly air forces for granted and hope that they will be able to give ample protection at all times.

It must also be borne in mind that very considerable progress has taken place recently in the development of air to ground weapons, particularly rockets with shaped charge heads. This is partly offset by the trend to supersonic speeds in fighter design which renders them less capable of attacking effectively relatively small ground targets. There are, however, several new types of slower ground attack aircraft, such as the French Potez 75 "tank stalker," or the U. S. Fletcher *Defender.* Were this aspect to be overlooked, helicopters armed with guided missiles, such as the S.S.10 already demonstrated in France, could also become a very serious threat.

It cannot be emphasised too strongly that neither the U. S. nor British armored forces have so far experienced anything approaching the full weight of tactical air attack. The Germans, on the other hand, have done and learnt from bitter experience how damaging it could be. Their reaction is therefore, particularly worth considering. And it was quite unequivocal: *effective organic* antiaircraft!

This meant the provision of an adequate number of properly engineered antiaircraft tanks down to the level of company, or at least armored battalion, which could inflict heavy punishment on low flying aircraft and make it very unprofitable for them to try to attack individual targets or vehicles.

The Germans were rather slow to realize this and had to pay for it in tank losses and a general loss of ability to maneuver. But when they did, the few organizations which they managed to equip adequately could make it impossible for Allied fighter-bombers to attack except at the cost of heavy losses.

The same need for organic antiaircraft tanks was realized in the British Army, though the actual need for them passed before they were ready. It was realized in the Japanese Army, which developed the *Taha* antiaircraft tank by the end of World War II. In theory it was also acknowledged in the Soviet Army.

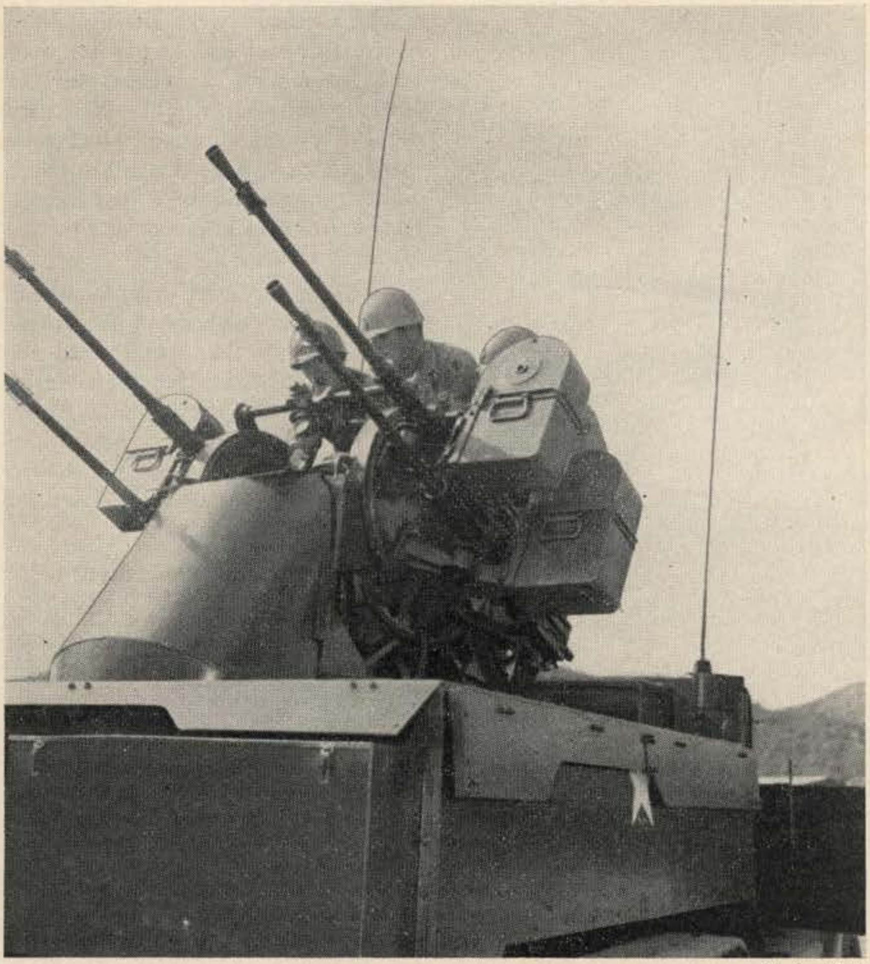
Antiaircraft Armament

From the experience of various armies it is evident that to protect armored units against close air attack requires effective organic antiaircraft. Given these, the most damaging form of low level attack against individual vehicles can be seriously discouraged and aircraft prevented from hampering too much the tactical mobility of armored units.

The form which an effective antiaircraft tank should take is governed largely by the type of armament considered necessary for this role. Up till now armored antiaircraft weapons have followed the armament of fighter planes. Thus, during World War II, .50 caliber machine guns were used in the United States and 20mm cannon in Britain and Germany, and further progress in this field becomes of particular importance.

The Germans, who led in the field of aircraft armament as early as 1942, came to consider 20mm as the minimum useful caliber for air combat. This operational research conclusion accelerated the development of 30mm cannon and led to the Rheinmetall MK-108 30mm cannon fitted to the 1944 Messerschmitt Me-262 jet fighters, the MK103 of the *Kugelblitz* AA tank and, finally, to the remarkable Mauser MG-213 C30mm revolver cannon.

The Germans had actually evolved even larger caliber fighter guns—of 55mm—for air to air combat but these were abandoned in favor of the 55mm R4M rocket, which achieved brief though remarkable success against



U. S. Army

In WWII armament of U.S. antiaircraft vehicles was the .50 machine gun.

B-17 *Flying Fortresses* in the very last stages of World War II. This line of development has since been continued in the United States and has led to the adoption of the 2.75 in *Mighty Mouse* rocket armament on several recent U. S. aircraft. The light rocket is, however, a rather specialized type of air-to-air weapon and for light antiaircraft defense guns will probably be superior for some time to come.

As far as guns are concerned, 30mm cannon have come to be considered as the optimum armament for aerial warfare, though the U.S.A.F. still favors the 20mm M39. The latest fighters in other countries, however, are being armed with 30mm cannon such as the British Aden, the French D.E.F.A. or the Swiss Oerlikon—like the U.S. M39 all based on the Mauser MG213C.

In the light of these very significant developments the same type of 30mm cannon would appear the most suitable for an antiaircraft tank. Its caliber and ceiling would be high enough to be effective against modern types of armored ground attack aircraft and yet small enough, in a dual installation, to be mounted in a relatively small vehicle, of under ten tons. The smaller and lighter it could be the better, of course, from every point of view and particularly that of cost and versatility.

Objections may still be raised against an antiaircraft tank on the grounds that there will not be much use for it. It should be quite clear by now, however, that effective friendly air cover under all conditions and in every place cannot be taken for granted and it certainly can never be guaranteed. There is, therefore, more than sufficient reason for developing antiaircraft tanks.

Important Ground Roles

There are also other and hardly less important reasons for developing this type of armored vehicle.

Essentially, the antiaircraft tank is an automatic weapon vehicle and as such is admirably suited for supplementing and complementing the firepower of gun-tanks, or armored vehicles with other types of heavy armament. To be more specific, the antiaircraft/automatic weapon tank is particularly well suited for dealing with hostile infantry and its antitank weapons. Gun-tanks can deal with hostile armored vehicles on at least equal terms. But when it comes to light, low silhouette short-range infantry weapons the gun-tank is often handicapped—like a man with an elephant gun going after rabbits.

The antiaircraft/automatic weapon tank would be much more effective in this role: it could neutralize infantry positions by a blanket of automatic weapons fire and, what is most important, seriously discourage hostile bazooka men and short-range guided missile operators; it could thus provide much needed protection to gun-tanks and support to armored infantrymen. The addition, for instance, of a number of antiaircraft tanks to each tank company would enable the gun-tanks to concentrate on their primary targets, such as hostile armored vehicles and heavy weapons.

The effectiveness of automatic antiaircraft weapons against infantry has been amply demonstrated in the past—in Europe, in the Pacific and in Korea. It is a role for which they are suited from another point of view for when they are required to engage hostile infantry they are least likely to be needed for antiaircraft defense.

In addition to all this, the same characteristics of volume of fire and small size would make the antiaircraft tanks invaluable in convoy duty, antiairborne and anti-guerilla operations, as well as lesser security and policing duties. In fact, they would be highly suitable for all the many tasks where the more powerful gun-tanks are unnecessary and where it is patently uneconomical to employ them. And these small scale operations are considered to be of increasing importance in the future.

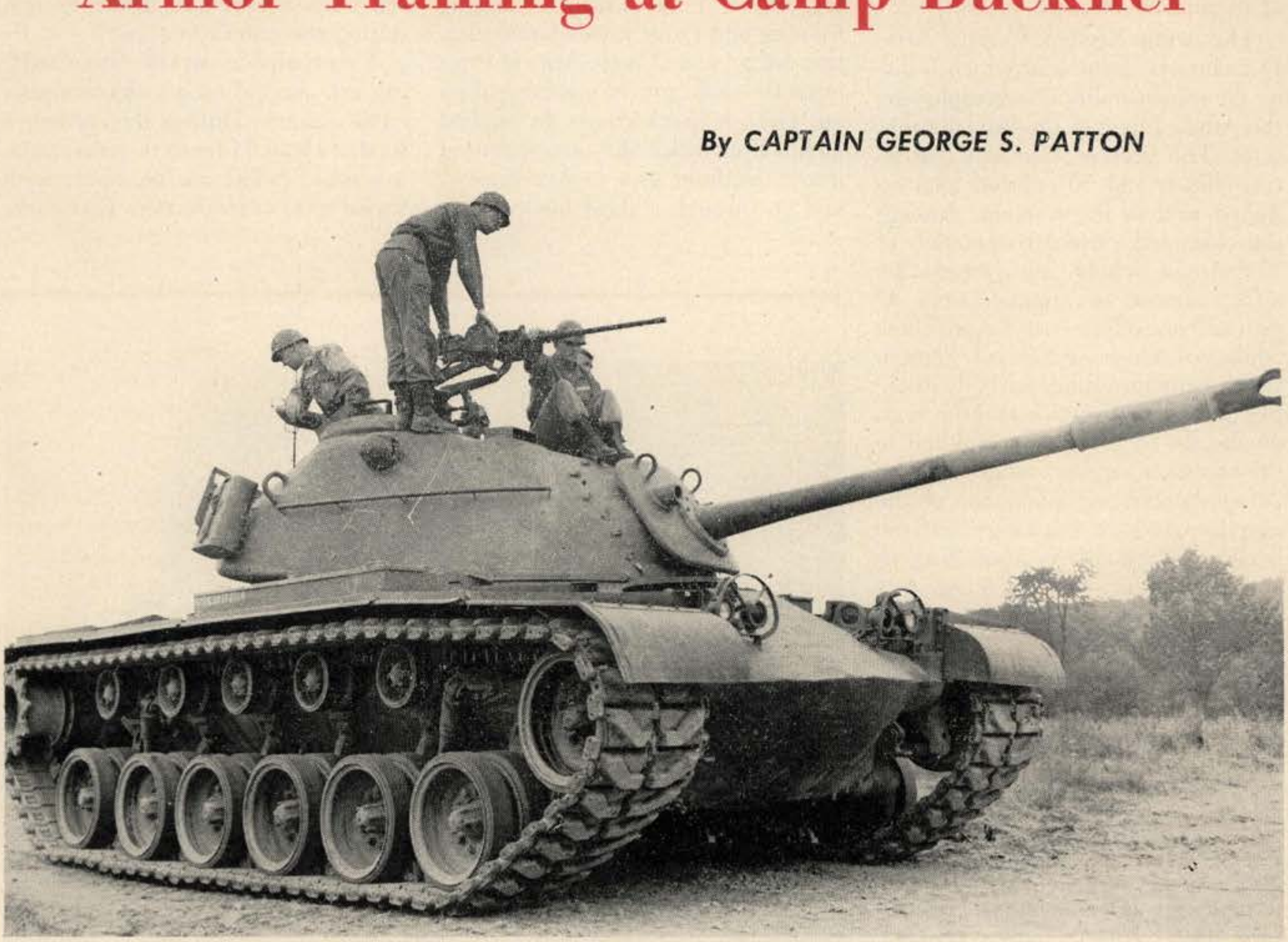
From all this it is obvious that there are many tasks which a properly designed and developed antiaircraft/automatic weapon tank could most successfully fulfill. The need for it is great even if the air threat were not as serious as it is.

WEST POINT

CARDED

Armor Training at Camp Buckner

By CAPTAIN GEORGE S. PATTON



U. S. Army

FOLLOWING the eagerly anticipated leave at the termination of 4th Class year, Cadets of the new 3rd Class, United States Military Academy, are assigned to the Camp Buckner Provisional Battalion, Camp Buckner, USCC, located approximately 9 miles west of the Military Academy.

From approximately 1 July until 29 August each year, when the Corps reorganizes for the coming academic periods, these new 3rd classmen undergo extensive weapons, small unit and leadership training which covers all phases of the combat arms tactics and techniques within our Army today. The overall mission of the Buckner program, listed in Military Academy Training directives, is to conduct individual and small unit field training for the 3rd Class, United States Corps of Cadets. In order to accomplish this mission, detailed objectives are assigned the Buckner program. Each cadet must fire and qualify with the M1 Rifle. He must become familiar with the Infantry weapons of the regimental combat team, with emphasis on the light machine gun. The cadet receives training in field firing techniques, and infantry squad and rifle platoon tactics. He receives familiarization instruction in the organization, equipment and capabilities of the tank platoon, field artillery battery and engineer combat company which form parts of the combined arms team. He is oriented on field type operations of the antiaircraft artillery, quartermaster corps, transportation corps and corps of military police. He receives instruction on basic signal communications. Lastly, he is instructed to teach and maintain proper standards of appearance, discipline and physical condition. Opportunities to lead men and groups of men and, further, to gain confidence through this training, are perhaps the primary by-products of the entire program.

The Buckner training program is implemented with troops and equipment of the Combat Arms Detachment, 1st Regimental Combat Team, USMA, which is reinforced during the summer months by detachments from troop units within the Con-

CAPTAIN GEORGE S. PATTON, Armor, a 1946 USMA graduate, served in Europe and Korea. Returning Stateside he was assigned to West Point as a Tactical Officer. He is now at the Naval Academy in a similar capacity.

tinental United States. These troops are carefully selected, normally high in noncommissioned officer talent, who work for the Regiment, and generally assist in the accomplishment of its summer mission.

The Armor Section, Combat Arms Detachment, is the unit which is given the responsibility of accomplishing the Armor Phase of the Buckner mission. The section normally carries two officers and 50 enlisted men assigned, and in the summer, through the close and careful cooperation of The Armor School, is augmented by a detachment of approximately 37 men and one officer from Knox. These additional troops are carefully chosen, with instructor rating, soldierly qualities and combat service ranking high on the list of criteria. In addition to the necessary augmentation from The Armor School, several cadets of the new 1st Class are also assigned to the Section. They aid in instructing in and supervising the 3rd Class program, and generally act in the capacity of junior officers.

The Armor Section is a small but compact unit organized as a part of the Combat Arms Detachment, 1st RCT. It is equipped with 15 M48 A1 medium gun tanks, and two M41 A1 light gun tanks. Recently one M59 Armored Personnel Carrier has been added to the section for the purposes of familiarization and display. The six M20 Turret Trainers, which are placed in firing position at Range No. 1 during the summer, are also part of the equipment of this section.

The training areas at Camp Buckner are small, and hence are not adequate for exercises involving even as much as a reinforced platoon in a moving fight. The terrain also precludes firing of the 90mm gun, 76mm gun and 50 caliber machine gun. However, good training, which develops the spark of interest and enthusiasm for the branch, is presented, terrain, or lack of it, notwithstanding. Two training areas are available to the Armor Section. The first (Range No. 1) is located southwest of West Point just off the reservation along Highway 9W. Here Cadets are given instruction in gunnery, communications and turret familiarization on the M20 Turret Trainer. They are required to fire a modified Table VII Course (moving target) using the coaxial machine gun and receive a grade in the exercise. The second and largest area is known as "Proctoria," located approximately 15 miles west of West Point near Central Valley, New York. Practical driving training and range finder familiarization are presented here. Also, at Proctoria, the cadet provisional companies are given a quick course in applied tactics after which they are organized into a medium gun tank company, and go through a short but comprehensive attack problem. More will be said about this most important of the Armor training phases below.

The Armor training at Buckner is also limited due to overall time allotted in the curriculum. Quite naturally, since this is the first real exposure of the type equipment and organization, all phases of training must be pitched at the very lowest level. Armor concentrates on the problems of the individual tank, tank section, and concludes by touching slightly on the platoon and company. This training does not qualify the cadet to be either a tank crewman or platoon leader, but merely familiarizes him. During all training, practical work is emphasized. Insofar as possible, the practical work is an application of the principles taught in the classroom by the Armor Section during the cadet's first year.

Two complete days of Armor training are allotted each cadet company (100 cadets). During this period, a total of about 14 hours of actual training time, cadets are presented with varied types of instruction. Each cadet is permitted to drive the M48 tank for about one thirty minute period. During the first half day he spends in the area, he learns to operate this vehicle over moderately rough terrain and is oriented on maintenance problems peculiar to tank units. Although it is not possible to fire the 90mm gun on the reservation, each cadet learns to operate the tank turret trainer, and take fixed and moving targets under fire. Functioning as a member of a three man fighting compartment crew, he is able to see in a moment the problems which lie in forming this crew into an efficient

U. S. Army

Armor training at Buckner concentrates on the problems of the individual tank.

combat team which can, through speed and accuracy, be expected to attack targets with efficiency and vigor. When an individual cadet is not actually working on the trainer, he is receiving concurrent instruction in armor communications and turret familiarization on the M41A1 tank. Approximately 3½ to 4 hours are spent in this important phase.

U. S. Army

Here are cadets of the 3 man fighting compartment crew loading 90mm shells.

The second day of the Armor phase at Camp Buckner is what might be termed the tactical phase. During the morning, a brief formal review of basic tactical principles is presented to the assembled company. This period is followed by an orientation on the exercise to follow. During the noon hour the cadet provisional company is divided into two parts, the first half of the company participating in the tactical exercise, and the second half reporting to a concurrent training area for range finder familiarization. The actual company attack is surely the highlight of the Armor section's instruction. The provisional tank company, manned almost entirely by the cadets themselves, is required to move through all phases of Armor offensive operations. Under the supervision of the officers and noncommissioned officers of the section, the platoons organize for combat. Cadet tank and platoon commanders are selected, and a provisional but workable organization is formed. The company then prepares for the attack. Reconnaissance is performed and the various steps of Armor troop leading procedures adhered to. During the actual conduct of the attack, the cadets are required to fight the vehicles through light opposition to the seizure and occupation of the company objective. The problem terminates upon completion of the reorganization phase. After a short critique, normally conducted by the Officer in Charge of the Problem and certain key instructors, the cadets are dismissed.

In the attack problem, the final phase of Armor Training at Camp Buckner, the true message of Armor is delivered to the cadet. The absolute necessity for proper maintenance, faultless communications and flexible and accurate control of fires, is, through the medium of the attack problem, re-emphasized to the cadets in a manner which has permanent effect. The challenge of integrating the crew to the vehicle and placing that vehicle within a tactical formation is vividly demonstrated. The requirement for shock, coupled with mobility of mind and organization, firepower and perfect signal communications is clarified. The tremendous combat striking power of Armor is emphasized.

The company field exercise, the final phase of all Buckner training, takes place during the latter part of August just prior to the return of the class to the Military Academy. Although this field exercise is an Infantry type problem, Armor does receive some play.

The cadets of the participating company observe an Armor-Airborne link-up operation with their unit which has been landed by helicopter into an airhead area. Although the tanks operating the link-up are manned entirely by Armor Section personnel, the coordination with regard to reception of the armored column is planned and executed by the cadets. Firing positions are selected for the approaching tanks, and sectors of responsibility are selected in order to initiate a smooth turn-over and efficient exchange of mission. The major problems of linking-up, a difficult operation at best, are clarified and pointed up.

Considering the amount of time allowed for familiarization with the branch, the unadaptable terrain, and the understandable lack of professional competence of the new third class, a tremendous amount of training is accomplished, and genuine benefit derived from the 14 hours allotted. For example, when in later life will the Air Force Commander, the Signal Officer, or the Engineer leader be presented with an opportunity to move, shoot and communicate in Armor? Therefore, considering the mission of Camp Buckner, USCC, and the method by which that mission fits in with the overall West Point mission, it is clearly evident that this brief training period serves to benefit the entire service in the accomplishment of its objective, success on the battlefield. Armor training at West Point contributes to that mission.

Russia 1944

CARDED

THE TANK BATTLE OF TÂRGUL FRUMOS

By LIEUTENANT GENERAL VON MANTEUFFEL

THIS account does not deal with the Battle of Iasi, but with the fighting of major tank formations at the beginning of May 1944, the center of which was Târgul Frumos, about 28 miles to the west of Iasi.

The big Soviet attack, with the object of breaking through to the Ploesti oilfields, fell entirely on the Panzer Grenadier division *Grossdeutschland,* which I was commanding at that time.

Previous History

The division had been engaged in planned withdrawal movements since the middle of March 1944. It had been thrown out of its positions west of Kirovograd about 19 March, and had assembled in the Kishinev area at the end of the month. There it received orders to drive northward immediately in order to delay and halt the Soviet advance which was threatening to break up the loose defensive front of the infantry formations, then only in the process of reorganization in this area. This mission was accomplished as a result of my division falling on the enemy swiftly and resolutely, in spite of extremely difficult weather and ground conditions. The snow was very deep there, and during the day there were frequently such heavy snowstorms that one could not see farther than a hundred paces. The heroic behavior of the troops and their exemplary determination succeeded in stopping the advance. In this way the other divisions were given the space and time to withdraw into my division's position, and to establish themselves under the protection of our tanks.

The two infantry regiments—the Panzer Grenadier ("A" on sketch) and the Panzer Fusilier ("B") regiments *Grossdeutschland*—had to carry the main burden of the fighting. They received splendid support from the tank units and the subordinate elements of the Panzer artillery regiment. The terrain was very hilly and favored the division in fighting, the division being extremely well-equipped with automatic weapons of all types.

It was intended to employ the division exclusively for defensive purposes on both sides of Târgul Frumos, with the heights north of Podulyukh ("H") as the eastern boundary. As I saw it, the possession of Târgul Frumos closed this gateway to the south, since from Târgul Frumos one controlled the only practicable road to the east of the Siret River ("L"). On the right of the division were employed first the 24th Panzer Division and then the 46th Infantry Division. I again relinquished command of the IV Army Corps, which I was also commanding. The divisional battle headquarters ("C") was in the town of Târgul Frumos at the western exit. From there I could overlook and supervise the employment of the division, both orally and visually, and had, in addition, a good network of roads and of rapid communication with my commanders. The place had been badly destroyed in the fighting, and it was, therefore, probably supposed that I would not be there. I was seldom disturbed by gunfire while working, eating, or playing bridge.

During April what I had foreseen when taking Târgul Frumos became more and more apparent from aerial photographs, and from radio interception and scout reconnaissance, namely, that the Soviets would have to come this way if they wished to thrust forward to Ploesti. I, therefore, asked for a postponement of my visit to the Führer's headquarters, where Adolph Hitler had summoned me in the middle of April, because I regarded the attack as imminent and did not wish to leave my troops. My request was granted and I was able to occupy my-

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self intensively with defensive preparations.

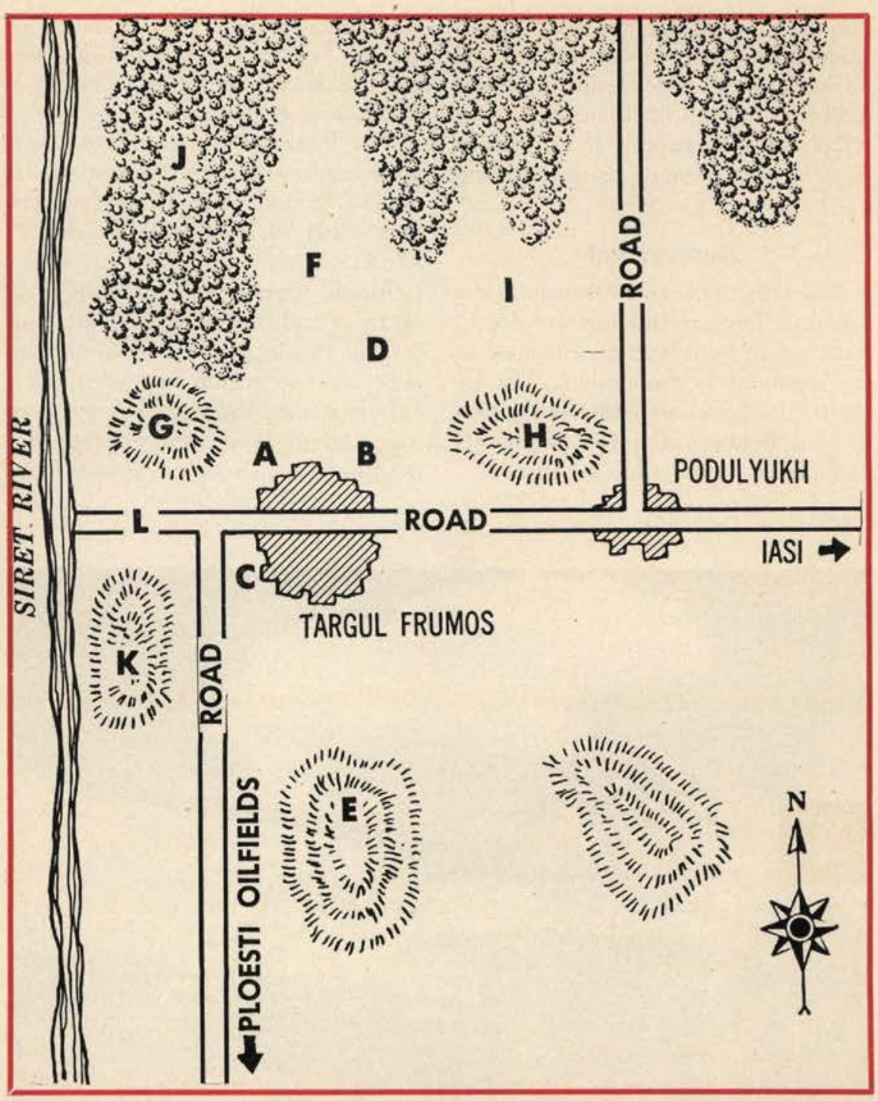
During those weeks the division *clawed itself* firmly into the ground—in the most literal sense of the words. All the troops vied with one another in preparing a suitable reception for the enemy. To the request from the Führer's headquarters that the division should be used in another place, and should be withdrawn, I replied that, since a major Soviet offensive was imminent, the division should be left in its positions. I considered its presence here indispensable until the attack was beaten off, in view of the division's thorough knowledge of the terrain, the number of the weapons, its morale, and its preparations for defense against this attack. This request was granted. This roughly represented the position as of 25 to 28 April 1944.

Now follow a few details concerning the terrain, fighting value, and organization of the force.

Terrain

The terrain north of the east-west line, Podulyukh-Târgul Frumos-Siret (Road "L") was everywhere practicable and passable for tanks with long fields of fire. The fact that the enemy was occupying the dominating heights everywhere north of this line was unfavorable, but it was at a distance of approximately 5 or 6 miles from our foremost covering forces, so that, as I hoped, he could only see the outline of our defensive system and not discover its finer points. We advanced our foremost covering forces to approximately 2,700 yards north of Târgul Frumos (to line "D"). South of the east-west line, rising terrain ("K" and "E") afforded us excellent observation posts and positions for antiaircraft and artillery. There was also a Soviet field position ("J") in front of the deep and broad wooded terrain ("G") in which the Romanians, who were very frightened, were digging trenches off and on. The natural vegetation in the entire sector of the division afforded us camouflage for the infantry positions, their heavy weapons, and for the assault guns.

Winter gave way to warm, sunny spring weather with clear nights, blue skies by day, and good visibility. The subsoil was sandy and, in general, dry.



Fighting Value

In the Rugionasa sector, on the left sector of the division ("G" and "K") as far as the Siret River, a Romanian brigade was employed in strong numbers, well-equipped with automatic weapons, including antitank weapons of a German model, and well-equipped with artillery. I had refused to mix them with my force, and took the risk—I spoke of the employment of the Romanians thus—on myself of leaving them an independent positional sector. A Soviet attack, if it fell directly on them, would still have to continue through the area around Târgul Frumos. I was confident of being able to encircle it there at the latest with the elements of my division, which is exactly what happened.

The division strength consisted of 2 infantry regiments, each of 3 battalions, each of 4 companies of 100 men, and, in addition, 1 battalion of heavy infantry weapons; 1 assault gun battery with about 40 guns; 1 engineer battalion at full strength; 1 reconnaissance battalion at two-thirds strength; 1 armored artillery regiment with 4 batteries, guns at full strength; and 1 antiaircraft artillery *Abteilung* with 3 batteries of 88-mm guns and 1 of 37-mm guns.

Ammunition and fuel were in good supply. Signal communications were good. The industrious buildup of a good network was carried out, although I placed more value basically on radio than on line communication. This was practically all destroyed by fire on the first day of attack.

The fighting value of the Romanians was low, and weighed nothing in the balance; they were a burden to us. The officer corps was poor. This judgment applies to all the troops employed in the Romanian boundary position, that is, left of and behind our positions, and the cavalry division held back behind the divisional sector which I had to supply. I counted on none of these formations—and turned out to be only too right!

Employment

Both infantry regiments were in the foremost lines, echeloned in depth, with strong local reserves available to the regimental commanders. The assault gun battalion *(Abteilung)* was divided between the two regiments and placed under their command.

U. S. Army

Mark V Panther Tank

The engineer battalion and reconnaissance battalion *(Abteilung)*, as well as the Panzer regiment, were held in the divisional reserve.

The four batteries *(Abteilungen)* of the Panzer artillery regiment, well-supplied with ammunition, were distributed over the entire divisional sector at the disposal of the regimental commanders, but assigned to the closest cooperation with the infantry regiment. Heavy concentrations of fire were not only prepared, but actually ranged and were tested over and over again, inconspicuously, of course. The heavy infantry weapons, including the infantry guns, were built into the defensive fire plan.

Of the 4 antiaircraft batteries of the division—of which 3 batteries were equipped with 88-mm guns—1 battery was employed and dug in north of Târgul Frumos for antitank defense, and the other batteries were employed in antiaircraft defense.

The Panzer regiment around Târgul Frumos was at the disposal of the division commander. Repair services were close by so as to be quickly at hand.

Ample supplies of ammunition of all types and fuel were available, and for this reason I wish to discount the "fairy stories," which have been given currency since the war, that we were supposed to have been short of ammunition at this time. Anyone who was troubled about his supplies received them.

The operating force had dug itself in "up to the neck," in accordance with my orders, and was distributed over the terrain in mixed battle groups to assure mutual fire support. The entire system of positions was reconnoitered by the regimental commanders, was reported to me, and then fixed so as to ensure uniform cooperation within the division. Supplies of food were good. The welfare of the men in every respect was the first consideration, and was attended to.

I gave my attention to reconnoitering with foresight the employment of the Panzer regiment. Many possibilities were discussed with the excellent body of officers, mostly together with the commanders of the other arms of the service, and settled on as soon as the plan was approved by me. This work went so far that the individual Panzer companies could be told their route and the area of their possible positions, so that the most junior commanders could make themselves familiar with the terrain, since for them knowledge of the terrain forms the basis of their fighting—more so than tactical considerations which they should leave to the battalion commanders.

Plan of Battle

My plan of battle was roughly as follows: As I could count with a probability bordering on certainty that the enemy would attack with strong armored forces in cooperation with strong artillery, the latter supported by good possibilities of observation, the attack should be driven off by means of the *employment of the massed Panzer regiment in mobile fighting*. I left in my statements no doubt at all that *one* regiment of the division would have to defend itself against the enemy alone; that is, without the support of the Panzer regiment since our own tanks could not be everywhere at once. A reconnaissance screen would cover the points where an enemy attack with strong armored forces was to be expected. These were then to be attacked by our tanks and destroyed in order that our tanks could then turn to the sector of another regiment if the employment of the division was still necessary there.

I, therefore, reserved the employment of the Panzer regiment for myself, and later took the regiment through all the phases of the attack. Indeed, up to the morning of the day of the attack, I had no idea where the point of main effort of the Soviet attack would lie. I thought that it would probably lie in the left divisional sector, because the Soviets might hope to stampede the Romanians there, and so be able to roll up my division by exploiting the partial success.

The purposeful and careful strengthening of the infantry's pockets of resistance, well-thought-out fire plans for *all* arms (that is, of the heavy infantry weapons; of the antitank weapons, including the elements of the assault gun battalion under command of the infantry regiments;

of the artillery and the elements of the antiaircraft artillery operating in a ground role in antitank defense), had to be arranged according to type of weapons, caliber, and ammunition. Assistance from neighbors had also to be arranged at the boundaries, just as if heavy and medium concentrations of fire were being prepared. The basic data for this purpose were obtained unobtrusively by firing.

The divisional battle headquarters was ideal. It lay, as has been previously described, just south of Târgul Frumos on an eminence (move headquarters back to "E") with observation post set up there from which one could supervise the entire sector of the fighting with ear and eye.

After full account is taken of the most careful preparations for defense against the attack, it was the fighting spirit of the force which was decisive. That turned the defense into what it became: a giant failure for the Soviets. There is no doubt that in any case the infantry had to carry the main burden of the fighting. The higher headquarters had no reserves.

There was very close contact with the flying formations of the air force. Its support was promised, but it was, as always, largely dependent upon the weather.

Course of the Battle

In April the Soviets kept quiet opposite the division. They fired little with their artillery, and were obviously saving ammunition. Reconnaissance of their artillery discovered numerous new positions. As was its custom, the infantry in position stayed where it was, committed, until the beginning of its attack; the prisoners brought in claimed to know nothing of preparations for attack. They could not, however, deceive me as to the imminent attack. This I expected to be on 30 April or 1 May. It was sunny weather, clear blue skies, dry ground, and very good visibility. At about 0400 it was light enough for rifle fire.

On 1 May, the day before the attack, it was still quiet on the front as before. After the air reconnaissance had reported strong concentrations in the enemy's rear positional area at midday, I gave orders for a bomber operation on the evening of 1 May, which was carried out. It could be deduced from numerous fires and explosions that the attack was successful. The prisoners taken the following day confirmed this.

On 2 May 1944, at about 0400, the day was started in by lively artillery fire which fell in the main on the forward positions only and did not reach the hinterland. Our camouflage must have been good, for losses in men and matériel were very slight. Although the fire was mainly harassing fire, it was, as is frequent with the Soviets, delivered doggedly. Looking back, I believe that this fire was intended to make the positions of our infantry and its heavy weapons ripe for the tank breakthrough.

U. S. Army

Joseph Stalin Tank

About an hour after the beginning of the artillery fire the attack of the Soviet tanks started, and approximately 30 minutes later tank fire struck Târgul Frumos. I saw from my battle headquarters the Soviet tanks rolling up to the town. Our own infantry had allowed them to roll past—partly in order to leave the prize to the antiaircraft battery of 88-mm guns dug in at the northern exit of Târgul Frumos. Most of the attacking tanks, of which there were about 25, were shot up in flames; the remainder, about 10, broke into the concentration area of our Panzer regiment and were destroyed.

I very soon got the impression that the main attack would come from the area northwest of Târgul Frumos onto the town and, therefore, ordered the Panzer regiment to move behind the west of Târgul Frumos in rear of the left sector of the Panzer Grenadier regiment ("G"). On this knoll a troop of assault guns, beautifully camouflaged, was dug in. As I drove up, about 2 companies of Soviet tanks, numbering about 30, were just attacking the knoll at high speed. There, too, the infantry operating in front had allowed them to pass.

The crews of the assault guns let the tanks approach within a *distance of about 30 yards,* and shot up *all* the attacking tanks in flames. Most of them exploded into fragments. I showed them later to experts, in order to prove to them the outstanding effectiveness of our antitank shells. We had not one dud. Another Soviet company drove in "goose march"—that is, in line one behind the other past where the Romanians, as expected, were dislodged, but this tank company was discovered in good time by a company of our own tanks and annihilated.

My first impression was confirmed by about 0800. *Wave followed wave of tanks which we shot up from favorable, previously reconnoitered firing positions and pursued.* As I was speaking to the commander of the Panzer regiment in his command car (intercommunication), we heard tank fire of the heaviest caliber from a great distance go past between our cars. We soon ascertained that it was being delivered from a distance of about 3,250 yards by heavy tanks which were firing from a stationary position there.

At first we thought a company of our own *Tiger* tanks had lost its way, because we had not previously met heavy tanks of this type on the Soviet side. One company of *Tiger* tanks (*Mark VI*) was ordered to come up, and these began to fire on the other tanks. One could see clearly the shells hitting these tanks, but they ricocheted off the armor plating.

The commander of the *Tiger* battalion who was present ordered the tanks to attack, drove up within approximately 2,175 to 1,950 yards of the enemy tanks, and opened fire on them. Thereupon, 4 of the tanks burst into flames, while 3 tanks, as far as I could see, immediately left the position at high speed. I gave orders to 1 company of *Mark IV* tanks, which was near me, to pursue and shoot up these tanks, starting from east of Rugionasa. The swift and maneuverable little tanks had the good fortune to come up under cover to within approximately 1,100 yards of these Soviet tanks, and to engage them from the rear. The enemy tanks stopped moving and firing—they were, as we later found out, burnt out. I have made many reports on *Stalin* tanks—advantages: heavy guns, heavy armor, low chassis, about 20 inches smaller than our *Mark V* tanks; disadvantages: slow, not maneuverable enough. The crews were, in my opinion, not yet sufficiently familiar with the tanks.

By about 1100 the Panzer regiment had shot up 250 tanks in the defense area of the Panzer Grenadier regiment. I noticed a hesitation in the enemy attack. Many tanks could still be seen, but they were firing at long range without attacking. We had at first no interest in thrusting so deep into the enemy's position with our tanks in an attempt to wipe them out; we hoped to engage them on the following day or at another place.

Meanwhile, since about 1000, alarming reports were coming in from the Panzer Fusilier regiment (right divisional sector). About 34 Soviet tanks had even penetrated into the village of Podulak, in which the battle headquarters of the regiment was located. During the close fighting, in which the regimental commander personally participated, 24 were shot up. Both the Panzer Fusilier and Panzer Grenadier regiments had been broken through at several points but had succeeded in separating the enemy infantry from the tanks and held their positions. The Soviet infantry had now to fight alone.

I had promised my friend Colonel Niemack, the commander of the Panzer Fusilier regiment, to link the Panzer regiment up with him at 1200. The situation was extremely critical there and full of danger. After 1100 a strong attack by Soviet armored forces went in again against this regimental sector. I, therefore, ordered the tanks in the sector west of Târgul Frumos, where every preparation had been made by the commander of the Panzer regiment in a foreseeing and exemplary manner, to provide the regiment as quickly as possible with ammunition and fuel again.

In the left sector, in the area of the Panzer Grenadier regiment, a mixed battalion of *Mark V* and *Mark VI* tanks, under command of the commander of the *Tigers,* had been left behind. I drove forward to the Panzer Fusilier regiment with a company of *Mark IV* tanks, reconnoitered the situation and the terrain, and put the Panzer regiment (which was following me) into the attack directly from the march. It actually appeared on the battlefield 5 minutes before 1200, the time at which I had promised the commander of the courageously persevering Panzer Fusilier regiment. The Panzer regiment immediately shot up about 30 Soviet tanks which were driving around in the rear area of the infantry regiment. By nightfall the situation was completely restored by the intervention of the Panzer regiment.

In both sectors a half battalion each of tanks *Mark V's* and *VI's* was brought into position before day broke, that is during the latter part of the night, so that they could make their tank fire effective in front of our own infantry when there was sufficient light for firing. The enemy's extraordinary tank losses, in conjunction with the fact that the Soviet infantry had not reached its first objectives at any point, allowed me to hope on the evening of 2 May that the worst was over. I was proved right. The Soviets did attack again on 3 and 4 May, but in spite of having fairly strong tank support, their attacks were broken up in front of or in our positions.

On 2 May our own bomber forces operated several times, among them the *Rudel* squadron, as antitank fighters. They gave effective support and shot up a considerable number of tanks. With bombs and aircraft guns they engaged the artillery and infantry positions and concentrations in the rear area most effectively.

Our losses still did not amount to more than 10 tanks or guns, although a considerably larger number were more or less damaged. The Panzer regiment, however, did not suffer a loss of fighting strength, thanks to the outstanding organization of the supply and tank repair service, and remained, as so often before, the faithful helper of the plucky infantry.

The success was great. The breakthrough in the direction of Ploesti had been delayed, the enemy's losses in men and tanks were so great that it could be seen that he had lost the desire to attack here again as long as the Panzer Grenadier division *Grossdeutschland* was in position. I estimated his losses in destroyed tanks at about 350 and about 200 damaged armored fighting vehicles.

Lessons

In my estimation, the success was due to:

1. The correct judgment of the situation in general.

2. The careful, reliable, and *detailed* preparation for defense, which ensured the closest cooperation of all *arms* within the division, in which each arm could be fully deployed in accordance with its technical and tactical characteristics.

3. The fire-readiness and fire-technique of all the antitank weapons and of the artillery.

4. The operational readiness and determination and the courage of the infantry, artillery, assault gun and antiaircraft artillery, and the offensive spirit of the tank crews.

5. The exemplary morale of all personnel knowing that each could rely absolutely on the other.

6. The correct appreciation of the battle situation in its various phases, and the appreciation of the terrain by the divisional command.

NEWS NOTES

Colonel Herbert H. Frost, radio pioneer, horseman and diesel motor industrialist, died on 10 September at the age of 63. He was interred in Arlington Cemetery. In World War II he served in the 2d and 13th Armored Divisions. He became Chief of Staff of the 13th and was wounded in combat in Germany. He was inventor and producer of one of the first radio head sets. In 1941 he became first vice-president of the Buda Company, now a subsidiary of Allis-Chalmers. He had been a council member and officer in this Association since 1941. He was instrumental in establishing the administrative setup of this office under which it now operates.

Dart Antitank Missile Contract Authorized by Army

The Department of the Army recently announced it has authorized negotiation of a contract with the Utica-Bend Corporation of Utica, Michigan, a subsidiary of Curtiss-Wright Corporation, for production of the Army's new antitank missile, the Dart. (See pages 36 & 37 for pictures.)

The contract is expected to amount to approximately $16,565,000.

The contractor has informed the Department of the Army that the contract will be performed at Utica, Michigan, a surplus labor area.

Developed by Army Ordnance under research and development contracts with Aero Physics Corporation of Santa Monica, California, now a subsidiary of the Utica-Bend Corporation, the Dart is designed for employment against tanks by Infantry and Armor combat units.

Army Test and Experimentation Center Established at Fort Ord

Establishment of an Army Combat Developments Test and Experimentation Center at Fort Ord, California, was announced recently by the Department of the Army.

Work at the new Center is expected to begin by November 1.

Troops of the 10th Regimental Combat Team, of the 5th Infantry Division, stationed at Fort Ord, will be used in the combat testing with one or two battalions from the 10th RCT spending short periods of time in field work at nearby Camp Roberts and Hunter Liggett reservations.

In making the announcement the Army said that the action will meet a long-standing Army requirement for centralizing the development and testing of new organizations, equipment and tactics. In the past the Army has used various areas for this purpose.

The Army's combat developments program got under way on an extensive basis in 1952 when it was formally established as a function of the Office of the Chief of Army Field Forces.

Under its new combat developments mission, CONARC is responsible for the testing of operational and organizational concepts and equipment for the Army in the field. It is expected that the Army Technical Services will make use of the new Center for experimentation and testing of new technical equipment, although this is not the primary purpose of the establishment.

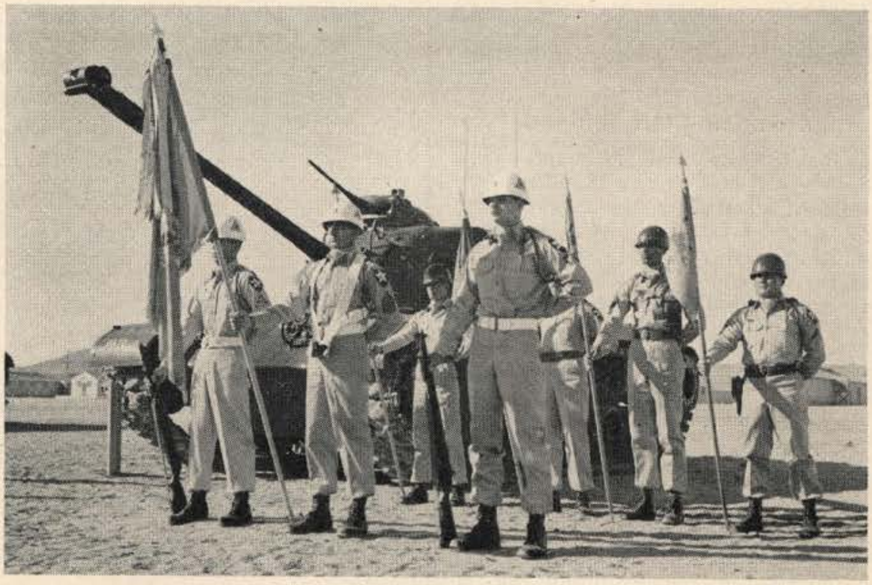
General Seawright New Commanding General of 48th Armored Division

Major General Patrick E. Seawright has taken command of the 48th National Guard Armored Division of Georgia and Florida.

He succeeds Major General Joseph B. Fraser who recently retired from the Guard.

General Seawright, an official of the Savannah Electric and Power Company, has been the Division Artillery commander since 1947. He saw service in both World Wars and was a member of the Navy before joining the Georgia Guard as a first lieutenant in 1930.

He commanded a Field Artillery battalion in Europe during World War II, earning five battle stars.



U. S. Army

The 723d Tank Battalion, stationed at Camp Irwin, California, awaits to retire its colors. The battalion gained its greatest fame under the designation of the 723d during the Spring of 1955 when it participated in Task Force Razor, a maneuver which proved the worth of Armor as protection against nuclear explosions. The unit's new designation is the 72d Tank Battalion, 2d Infantry Division.

Army Awards Contract for Operation of Helicopter Pilot Training School

A contract for $890,215 has been awarded to the Southern Airways Company of Atlanta, Georgia, to operate through June 30, 1957, the Army primary helicopter pilot training school at Camp Wolters, Texas, the Department of the Army announced recently.

This is the Army's first major endeavor in the field of training helicopter pilots by civilian contract. A total of 27,000 flying hours under this contract is estimated for Army student pilots during Fiscal Year 1957.

Flight training for approximately 50 student pilots will begin January 7, 1957, with a new class entering every four weeks.

Four More Guard Units Authorized Additional Strength

Four Southern California National Guard units have been authorized to recruit themselves up to full wartime strength, or an increase of about 30 percent over the normal peacetime National Guard allotment.

The four units, all part of Southern California's 40th Armored Division, are Company B, 224th Armored Infantry Battalion, Colton; Battery B, 214th Armored Field Artillery Battalion, Highland Park; Medical Detachment, Division Headquarters, Los Angeles; and Medical Detachment, 132d Armored Engineer Battalion, Manhattan Beach.

In each case, the unit had built its strength up to the maximum manpower figure permitted by National Guard organization tables before receiving Department of the Army permission to move toward the higher goal.

The new authorizations bring to eight the number of 40th Division units attempting to reach wartime strength.

Attention CMH Winners!

The Congressional Medal of Honor Society will hold its first National Convention this coming November during the period 9-14. The Society is having difficulty locating Medal of Honor recipients. Although it may be too late to attend this year's convention all recipients are asked to contact Mr. Richard W. O'Neill, Executive Director of the Society, at 36 West 44th Street, New York 36, New York.

Official Army Song

Secretary of the Army Wilber M. Brucker has directed that the official Army song be officially dedicated at U. S. Army installations throughout the world on November 11, Veterans Day, and play an important part in ceremonies of the day. Copyright is held by the U. S. Army. The lyrics are boxed on the right.

THE ARMY GOES ROLLING ALONG

(Based upon "The Caisson Song" by Brigadier General E. L. Gruber.
Revised and adapted by H. W. Arberg)

Verse:
March along, sing our song
With the Army of the free.
Count the brave, count the true
Who have fought to victory.
We're the Army and proud of our name!
We're the Army and proudly proclaim:

First Chorus:
First to fight for the right
And to build the nation's might,
And THE ARMY GOES ROLLING ALONG.
Proud of all we have done,
Fighting till the battle's won,
And THE ARMY GOES ROLLING ALONG.

Refrain:
Then it's hi! hi! hey!
The Army's on its way.
Count off the cadence loud and strong:
For where'er we go, you will always know
That THE ARMY GOES ROLLING ALONG.

Second Chorus:
Valley Forge, Custer's ranks,
San Juan hill and Patton's tanks,
And the Army went rolling along.
Minute men from the start,
Always fighting from the heart,
And the Army keeps rolling along.

Refrain:
Then it's hi! hi! hey!
The Army's on its way.
Count off the cadence loud and strong:
For where'er we go, you will always know
That THE ARMY GOES ROLLING ALONG.

Third Chorus:
(slower, more freely)
Men in rags, men who froze,
Still that Army met its foes,
And the Army went rolling along.
Faith in God, then we're right
And we'll fight with all our might,
As the Army keeps rolling along.

Refrain:
(In tempo)
Then it's hi! hi! hey!
The Army's on its way.
Count off the cadence loud and strong (two! three!)
For where'er we go, you will always know
That THE ARMY GOES ROLLING ALONG! (Keep it rolling!)
and THE ARMY GOES ROLLING ALONG!

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news from
THE ARMOR SCHOOL

Armor Reserve Training

A PREVIOUS article on Armor Training contained a discussion of the production cycle used to train armored units, a subject most applicable to the active side of the Army. This article will encompass in general terms the other side of Army training—training in the National Guard and Army Reserve.

It is important in approaching this problem of reserve training that several basic assumptions be made by The Armor School. Since The Armor School is the nucleus of all armor training and the coordinator and originator of armor doctrine for the United States Army, it follows that it must be of primary interest to The Armor School that the level of training in Army Reserve and National Guard armored units be standardized and maintained at as high a level as possible. There are inherent in reserve training a great many problems peculiar to armory type training. It has been determined that some of these problem areas can be solved, or partially alleviated, by positive action and leadership in armor training by The Armor School. In recognizing the fact that reserve training is of vital interest to The Armor School, liaison visits were begun this year by representatives of the Training Program and Test Branch, General Subjects Department, in an effort to crystallize problem areas within the reserve so that intelligent, forward-thinking training programs can be developed.

Through this personal contact, several general problem areas have been developed. To digress for a moment, however, let us consider reserve training as a whole. It is important to recognize the several factors which are peculiar to this type of training.

Factors

1. Most critical is the time factor. Reserve training is run on a 96 hour 48 drill basis with two weeks active duty training each summer.

2. The fact that the reserves are composed of civilians, most of whom are engaged primarily in civilian occupations.

3. The geographical limitations imposed on proper training caused by great distance between headquarters, headquarters and subordinate units, etc.

4. The great turnover of personnel.

5. A tremendous variation among the reserve in training facilities and equipment.

With these factors in mind, the following general problem areas are being considered as those in which The Armor School can exert the most immediate influence.

Problem Areas

1. The development of a program for training recruits enlisted directly into the National Guard or Reserve. Data collected indicates between 30 and 50 percent of reserve units must conduct recruit training each year.

2. A training program should be written for the advanced individual or MOS training period which covers 96 hours of armory training and two weeks of summer field training. The present "48 drill unit" column is much too general for reserve use and serves only as a very general guide to subject material. Specific guidance should be given as to subject material, programming, subject schedules, etc. If a realistic program can be published which is tailored to fit the needs of the reserve and National Guard, a great many man-hours will be saved, and training throughout the reserve will tend to standardize. Any effort in this field, however, requires coordination in the areas of civil defense, necessary parades and administration, etc. In addition only those subjects should be included which will train a man to become proficient in his own job. With the time factor as critical as it is, the reserve cannot afford the luxury of a great many nice-to-know subjects.

3. A training program designed for units who are capable of absorbing some unit training. A unit which has progressed beyond the advanced individual phase should not be required to repeat MOS training, but should be allowed to progress as far as local facilities and unit *esprit* will permit.

4. Greater emphasis can be placed on training management and instructor training in company grade officer classes at The Armor School, in order to more thoroughly prepare the junior reserve officer to conduct an effective training program.

Continued liaison with reserve units in the field is expected to keep The Armor School abreast of current training problems. Meanwhile, work is progressing in the problem area outlined above as rapidly as possible.

Further articles in this series will outline training methods, techniques, and programming. Individuals and units in the field are encouraged to write to: Training Program and Test Branch, General Subjects Department, The Armor School to request or offer information in the field of training either active or reserve units.

Move, Shoot and Communicate

"The commander alone is responsible for all that his unit does or fails to do. He cannot delegate this responsibilty.

"Every commander is responsible that signal communications are established and maintained from his command post to those of subordinate units. . . . Without effective signal communications, a commander and his staff are isolated and become ineffective."

The above extracts are taken directly from FM 101-5 "Staff Organization and Procedure." These formal statements can be condensed into one brief sentence: "The commander is responsible for communication." We have all read or heard similar statements many times in our military careers. Many of us have seen how poor communication planning has resulted in tactical defeat, loss of life and capture of personnel and equipment. On the other hand, we have seen how the commander who is kept constantly advised of the changing enemy and friendly situations, and who has the ability, through effective communications, to control the elements of his command and influence the conduct of battle, has accomplished his assigned mission. Fortunately, the success stories outnumber the failures.

Since, however, many historical examples of tactical failure can be attributed to inadequate or improperly supervised communication systems, each of us, as either future commanders or as staff officers assisting the commander in carrying out his responsibility, should examine more closely the communication aspect of command responsibility.

What does this responsibility involve? What must a commander know and how must he function to properly carry out this responsibility? What communication requirements must be satisfied to insure that failure to achieve an objective is not the result of inadequate or improperly supervised communications?

The answers to these questions obviously cannot be set down in so many words. Responses necessarily must be dependent on the size of the unit involved, the nature of its mission, the terrain, enemy situation, friendly dispositions, state of training and other important considerations. These questions, therefore, must be examined to determine the fundamental principles involved. Application of these principles, of course, will depend on the well-known "situation."

On December 16, 1944, a reconnaissance troop of an infantry division was occupying a position between two regiments. Lateral communication had been accomplished by wire to the unit on the right and by patrols to the unit on the left. Although the troop had 13 radio sets capable of providing reliable communication for a distance of at least 25 miles, they were not in use because the troop was on radio silence. The troop commander had failed to provide a listening watch for even one of these radios. After other means of communication had been destroyed and contact with adjacent and higher headquarters by messengers or patrols became virtually impossible due to enemy activity, it became apparent that radio was the only means of communication available for calling for artillery support, supplies or instructions. The pertinent extracts of the SOI, however, were not available, and the radios could not be netted in the regimental or division nets. The unit was isolated; information of the enemy was available but could not be passed to higher headquarters; they could not call for artillery fire on the enemy troops which were attacking; fear, based on tactical ignorance resulting from loss of communication, soon drove from the soldier's mind his will to fight. The troop commander surrendered, formally relinquishing the command—a command which he had effectively terminated when he failed to provide adequate communication.

The lessons of war are costly; once learned they should not be forgotten. Let us then examine the term "adequate" communication. What is adequate?

A communication system must provide the commander, at any level, with the ability to control the elements of his command, to relay orders, to receive information of the changing situation, to contact adjacent and higher headquarters, to influence the battle by timely use of the reserve and the available fire support and to provide logistical support. In short, communications provide the commander with the means to command.

The basic requirements to be satisfied are command, control, liaison, intelligence, fire support and logistics. The increasing tempo of modern warfare and the ever-present threat of mass destruction weapons dictate a further requirement—command survival. Communication must be maintained at all times. Continuity of communication can be accomplished only by full exploitation of all the means available, to include radio, wire, messenger, visual and sound. No one means can be relied on entirely. Alternate channels over alternate routes must be immediately available.

The degrees to which each of these requirements can be satisfied will depend of course on the facilities available to the commander. Each means must be evaluated in terms of range, speed, security and reliability. To achieve command survival, reliability is all-important.

The commander must know the communication equipment available, the capabilities of that equipment, and how it can best be employed to satisfy his requirements. He must know the personnel available to operate this equipment and must insist that all are properly trained. He must see that communication equipment is properly maintained to insure its readiness for immediate use. The commander must insure that his communication system is integrated into the system of the next higher headquarters. He must realize fully that communication is a contributing factor in achieving maneuver, security, surprise, and in maintaining the momentum of the attack—an indispensable tool of battle.

The war of the future will place increasing demands on our communication system. The requirement for range will be increased by the requirement for dispersal of units. The necessity for rapid concentration of force will accentuate the need for speed in communications. Security, in the face of atomic weapons, takes on a new importance. Finally, reliability of communication will insure survival of command.

A tank battalion commander who has lost contact with his staff and his companies becomes only a lieutenant colonel wandering alone on the battlefield. A commanding general, under similar circumstances, no longer commands.

Prepare now for that day in the future, when you as a commander will say, "Battalion attacks at ——." Consider the role that communication will play in the success of that attack. Know your equipment, know your men, insure that the basic requirements of an adequate communication system will be satisfied.

There is no substitute for command emphasis on communication.

Maintain Those Turrets

Are you the commander of a platoon, company or battalion of tanks? If so, you are surely aware that the definition for a tank includes the phase, "FIGHTING VEHICLE," and that the means for fighting are located in the turret. It follows, then, that a tank without serviceable turret armament, controls and equipment is not a fighting vehicle at all. It is just a 50-ton passenger vehicle unable even to protect itself, much less do the job for which it was designed.

TANKS EXIST TO SHOOT. Their mission requires quick kills at long ranges. This is possible only when the turret equipment, which was designed for speed, accuracy and maximum target destruction, is maintained in tiptop condition; and your men must know it. To obtain good results you must maintain these turrets. Would you engage an armed thug in an alley without confidence in your weapon and your ability to use it?

PREVENTIVE MAINTENANCE SERVICE IS YOUR ANSWER. *Preventive maintenance service* is not just a phrase; it means hard and continuous work which requires the skill and cooperation of all men who call themselves tankers. Nevertheless, it is rewarding work. The thrill and pride you feel when the men you have trained spot their targets and efficiently destroy them in rapid succession is the reward you get for keeping your turrets in good condition. Your men will know that they couldn't have done it without good maintenance. If you permit your men to fire from tanks with defective turrets, they lose confidence in their tanks and you lose the many months you spent in their training. If you let this happen in combat you will lose more than that, for maintenance is a life-and-death matter in battle.

What is necessary in order for you to get this job of preventive maintenance done right? Consider the following items and determine for yourself whether you are making full use of the means available to you.

1. *Full knowledge of your maintenance responsibilities.* AR 750-5 and TM 9-2810 are the basic references. The pertinent technical manual, allocation of maintenance and standard nomenclature lists (SNL), indicate specific responsibilities for each echelon of maintenance. Your supporting ordnance officer will furnish guidance if you request it.

2. *Your willingness and ability to plan, schedule, organize and supervise preventive maintenance services.* TM 9-2810 and the pertinent technical manual contain information regarding PM service schedules. The best way to learn how to organize and supervise the job is to do it frequently, but study will prepare you. Remember, servicing turrets and guns isn't just cleaning; it includes inspecting, testing, servicing, tightening, repairing, lubricating, and reporting any deficiency which you cannot correct. It means to do the things which will insure trouble-free operation until the next scheduled service period.

3. *The training of your crews and turret mechanics.* Your primary goal in this field is to instill pride in equipment. You train your crews by providing them with the guidance, supplies, parts, tools and time which are necessary; then keep the crews intact. You use a full crew when the tank is operated, and require a thorough job of maintenance. You prevent abuse of equipment by training and thereby save manpower and money. Turret mechanics should be trained at The Armor School (Course 17-E-4), then receive additional on-the-job training in the unit.

4. *Your ability and diligence during inspections.* The pertinent technical manuals contain guides for inspections; however, it is recommended that you prepare your own detailed list including the items you wish to stress. Keep in mind that you must have a procedure, know what to look for, know how to find it, record your findings, and above all, take action to correct deficiencies. Inspections may be command, spot-check, or technical, but the key words are always the same: INSPECT—DETECT—CORRECT.

5. *The assistance and support you receive from other personnel.* This includes higher commanders and staffs, other unit commanders, tank crews, turret mechanics and other maintenance personnel. This assistance is gained through leadership, chain of command and liaison. Major echelons of command and their staffs must provide the guidance, supplies, time and other support.

The historical example cited in this article was taken from a military monograph prepared by Ralph E. Kuzell, Major, Cavalry, 28 April 1948.

KEY PERSONNEL CHANGES

Colonel John B. Sullivan, Director of Instruction, departed for his new assignment as Armor Advisor, CONARC.

Lieutenant Colonel Herschel H. Hutsinpiller was assigned as Chief of the Allied Liaison Section.

Lieutenant Colonel Frederick E. Van Tassell departed for his new assignment with the 526th Armored Infantry Battalion, Fort Knox, Kentucky, and Lieutenant Colonel J. W. Levy assumed duties as Associate Arms Chief and Senior Infantry Officer, Command and Staff Department.

Major Francis W. Quinn assumed duties as Supply Officer.

6. *Supplies for use during PM services.* The supplies which you will need are extensive but are authorized by Supply Manuals, SNLs, TAs and TOEs in ample quantity. You must take the action to obtain them and use them properly. They include such items as manuals, tools, parts, lubricants and cleaning materials.

7. *Time to perform PM services.* Time is the most critical item on the list; this applies whether in training or in combat. The commander must not fall into the habit of scheduling everything *but* maintenance for the week, then find that he has an hour or two left over, and thereby arrive at the number of hours available for maintenance of his tanks. A better solution would be to develop a plan based upon a realistic appraisal of the time and personnel required to maintain his equipment; then integrate this into the training schedule. He must provide the personnel, supplies and supervision at this time. It takes very little figuring to determine, for example, that in a tank company of 17 tanks you must provide for 884 scheduled PM services in a year (680 weekly, 136 monthly and 68 quarterly) in addition to the daily before- and after-operation services. And don't forget to provide men to clean the guns for three successive days after firing!

Good preventive maintenance will yield rich rewards. It is a task worthy of your best planning and execution. The results will permeate your entire unit and will be apparent to all. You will have a good outfit and your tankers will be proud of it.

Replacement of Standard Type Generating Systems

For many years some method has been sought to improve the battery charging systems of military vehicles. Low output generating systems have often failed to provide adequate current to maintain vehicle batteries at the required state of charge during prolonged periods of radio operation.

Therefore, extensive study and research was initiated to develop a suitable high output generating system. This research led to the development of a rectified AC generating system, designed for continuous duty which provides high DC output at all engine speeds and furnishes ample electrical current for all accessories.

This new high output AC-DC generating system is standard equipment on the M59, Armored Infantry Vehicle. In addition, the Kit, Generator High Capacity, AC-DC-100 ampere, has been placed in Ordnance Supply channels and is being issued to using units for installation on wheeled vehicles which are required to keep constant radio watches and those used as command vehicles.

The outstanding advantage of this generating system is its high output at low idling speeds. This permits the operation of the radio equipment on the vehicles for long periods of time without interference from engine noises, and at the same time provides adequate power supply.

Thus, with the installation of this new and improved high capacity generating system, field commanders can expect to have an adequate electrical supply for sustained operation of radios and electrical accessories, and at the same time economize on fuel and reduce engine wear.

THE ARMOR SCHOOL HONOR GRADUATES

The following students received top scholastic honors of their classes (listed in order of rank in the class):

Armor Officer Basic Course Nr 8

2d Lt. Robert C. Bittinger, 11th Cav. Regt., Fort Knox, Ky.; 2d Lt. Morton L. Fiax, 11th Cav. Regt., Fort Knox, Ky.; 2d Lt. Avron B. Magram, 30th Tank Bn., Fort Knox, Ky.

Armor Advanced NCO Nr 8

MSgt. James L. Morris, Svc. Btry., 276th Armd. FA Bn., Fort Knox, Ky.; SFC Robert H. Vaughn, Co. L, Stu. Regt., The Armor School, Fort Knox, Ky.; Sgt. Ian C. Shearer, OS Repl. Sta., 1264 SU, Fort Dix, N. J.

Armor Track Vehicle Maintenance Course Class Nr 1

Pvt. Vincent Marayanski, 28th Inf. Regt., Fort Carson, Colo.; SP3 Samuel M. Tucci. Svc. Btry. 249th Armd. FA Bn., New York, NG; Pvt. Burke C. Stillwell, 64th Tank Bn. 3d Inf. Div., Fort Benning, Ga.

Armor Track Vehicle Maintenance Course Class Nr 20

Pvt. Otto Mueller, Jr., 6021st SU, OS Repl. Dep., Fort Lewis, Wash.; Sgt. Jack S. Detweiler, 83d Ord. Co., Fort Knox, Ky.; SFC Robert T. Remsberg, 64th Tank Bn., 3d Inf. Div., Fort Benning, Ga.

Armor Track Vehicle Maintenance Course Class Nr 21

SP2 Karl G. Noeth, Hq. Btry., 127th AAA Bn., Albany, N. Y.; Pvt. Ambrose Jones, 550th AAA Bn. (90mm Gun), Norfolk, Va.; SFC Henry L. Henderson, Hq. Co., 1st Bn., 11the Armd. Cav., Fort Knox, Ky.

Armor Radio Maintenance Course Class Nr 11

Pvt. Henry G. Caddock, 1st Tank Bn., 1st Armd. Div., Fort Polk, La.; SP3 Paul J. Clark, 44th Tank Bn, Fort Stewart, Ga.; SP2 Charles D. Greene, Co. B, 242d Tank Bn., KY NG, Ashland Ky.

Armor Radio Maintenance Course Class Nr 12

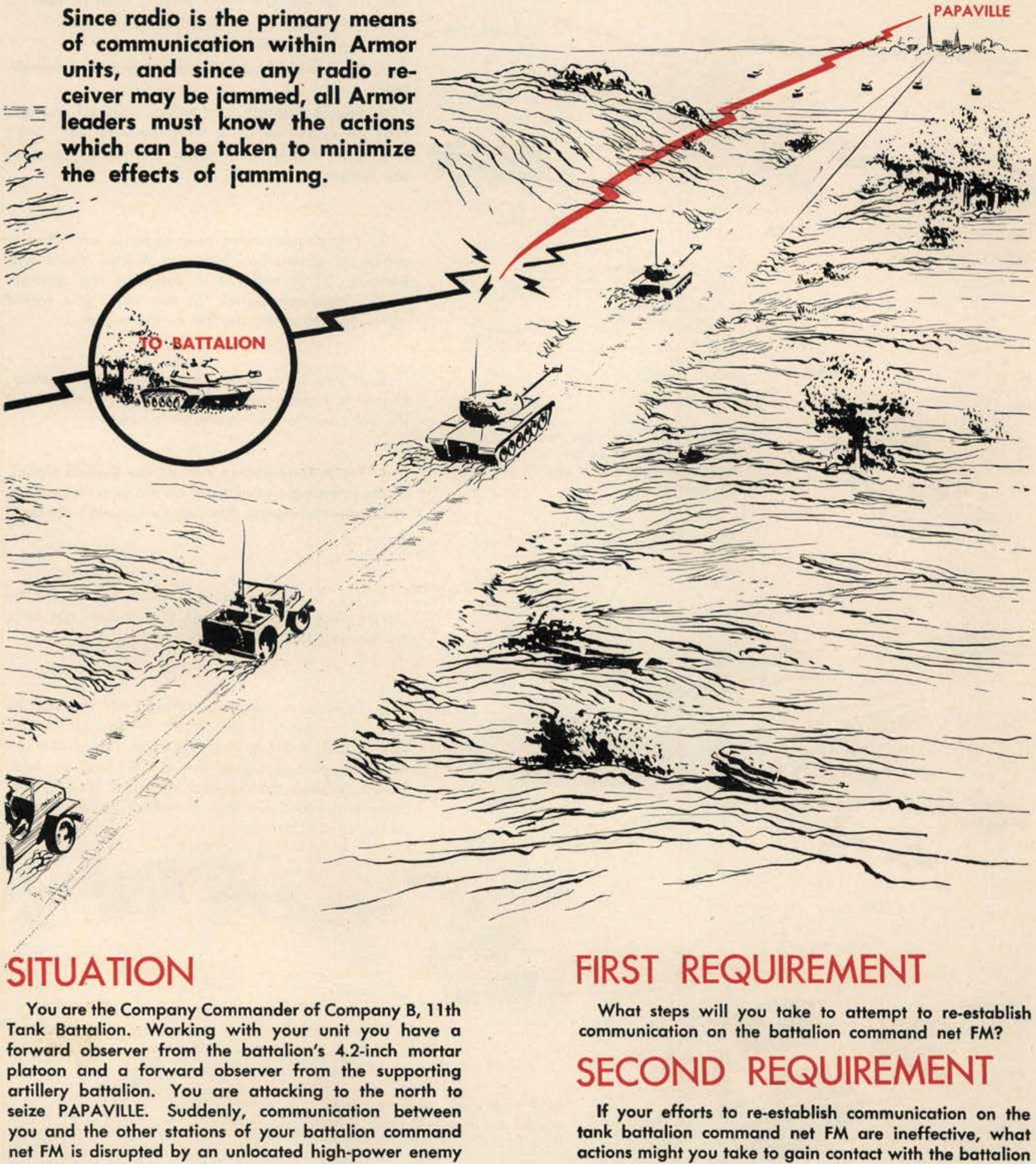
SP2 Jack H. Bennett, 704th Tank Bn., 4th Armd. Div., Fort Hood, Texas; Pvt. Richard C. Cox, 1st Tank Bn., 1st Armd. Div., Fork Polk, La.; SP3 Richard C. Guier, 100th Tank Bn., 1st Armd. Div., Fort Polk, La.

CARDED

HOW WOULD YOU DO IT?

AN ARMOR SCHOOL PRESENTATION

Since radio is the primary means of communication within Armor units, and since any radio receiver may be jammed, all Armor leaders must know the actions which can be taken to minimize the effects of jamming.



SITUATION

You are the Company Commander of Company B, 11th Tank Battalion. Working with your unit you have a forward observer from the battalion's 4.2-inch mortar platoon and a forward observer from the supporting artillery battalion. You are attacking to the north to seize PAPAVILLE. Suddenly, communication between you and the other stations of your battalion command net FM is disrupted by an unlocated high-power enemy jamming station.

FIRST REQUIREMENT

What steps will you take to attempt to re-establish communication on the battalion command net FM?

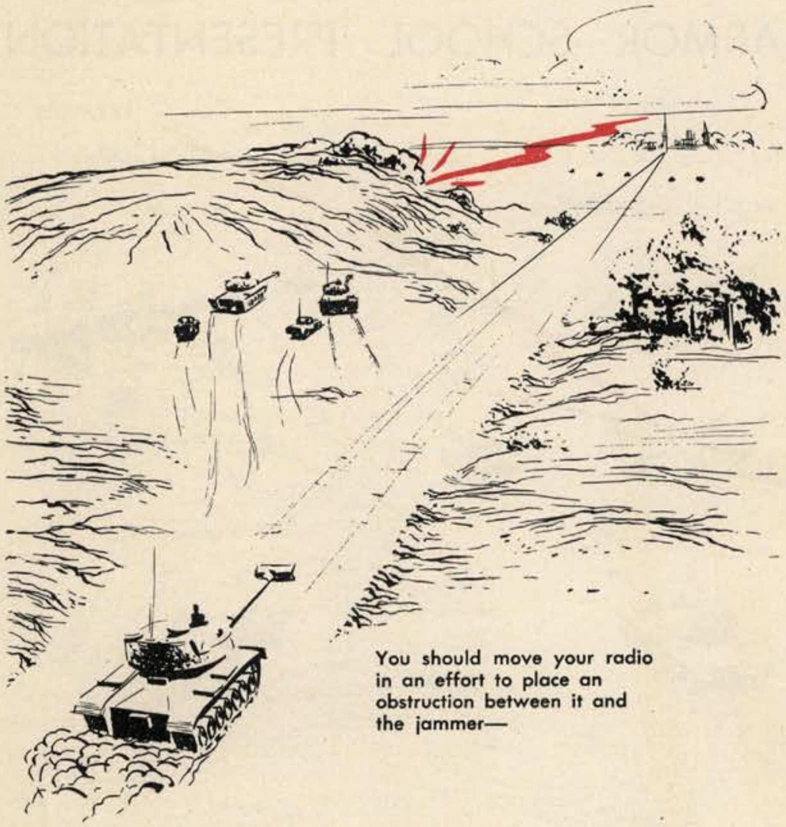
SECOND REQUIREMENT

If your efforts to re-establish communication on the tank battalion command net FM are ineffective, what actions might you take to gain contact with the battalion commander by other nets or other means?

AUTHOR: LT T C HATHAWAY

ILLUSTRATED BY: MR J H BAIN

Solution — FIRST REQUIREMENT



You should move your radio in an effort to place an obstruction between it and the jammer—

1. First, you must report the jamming to battalion by the fastest available means. The report should be as detailed and accurate as possible, and should include the following information:

a. Frequency or channel being jammed.

b. Type of jamming signal.

c. Time and duration (continuous or intermittent).

d. Signal strength and effect. (Signal strength may be classified as strong, medium, or weak.)

e. Unit, name, and grade of operator making the report.

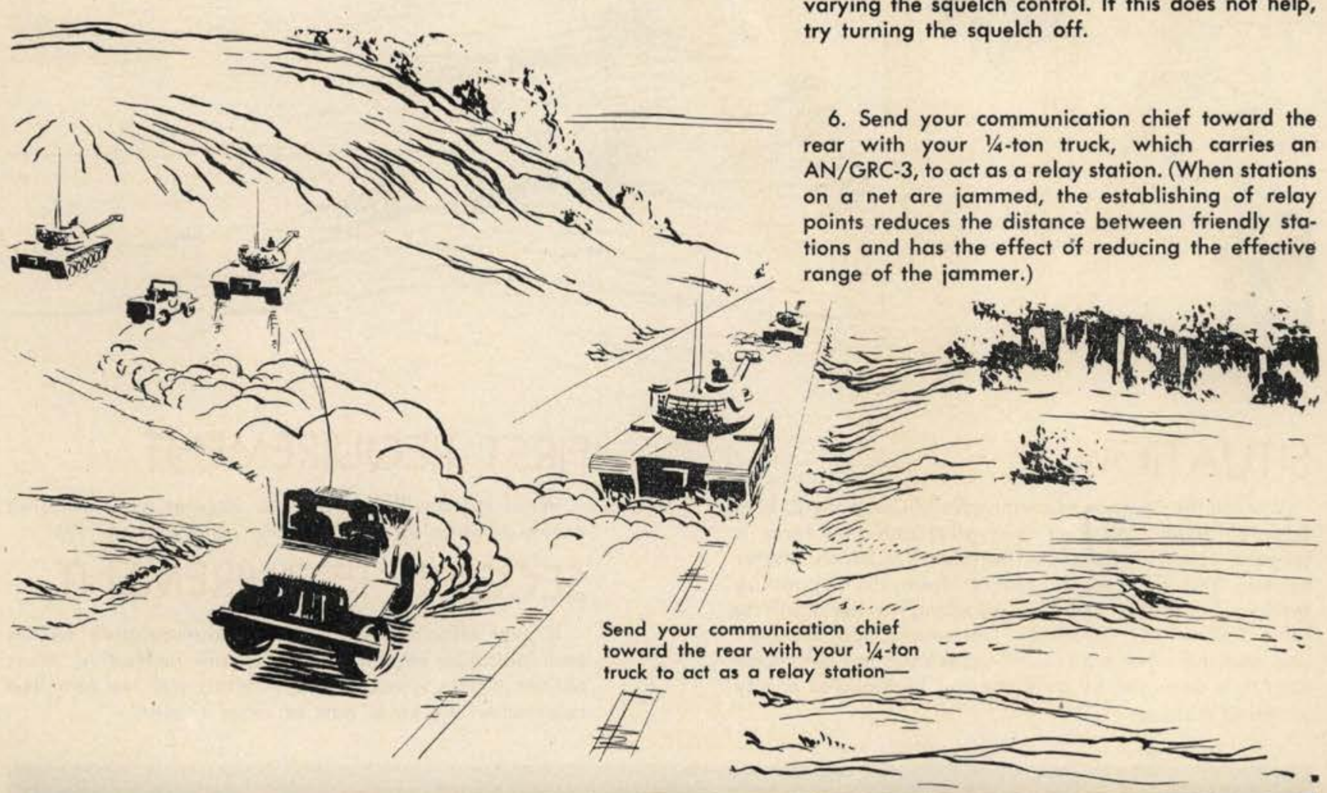
2. You should move your radio in an effort to place an obstruction between it and the enemy jammer. (This will aid in reducing the strength of the jamming signal. In this case, you would move behind either the hill or the woods.)

3. If you have been operating on low power, switch to high power. (All sets in a jammed net should operate at maximum power.)

4. Try to tune to one side of the desired signal. (If the jamming signal is not on the exact frequency of the desired signal, this may re-establish contact.)

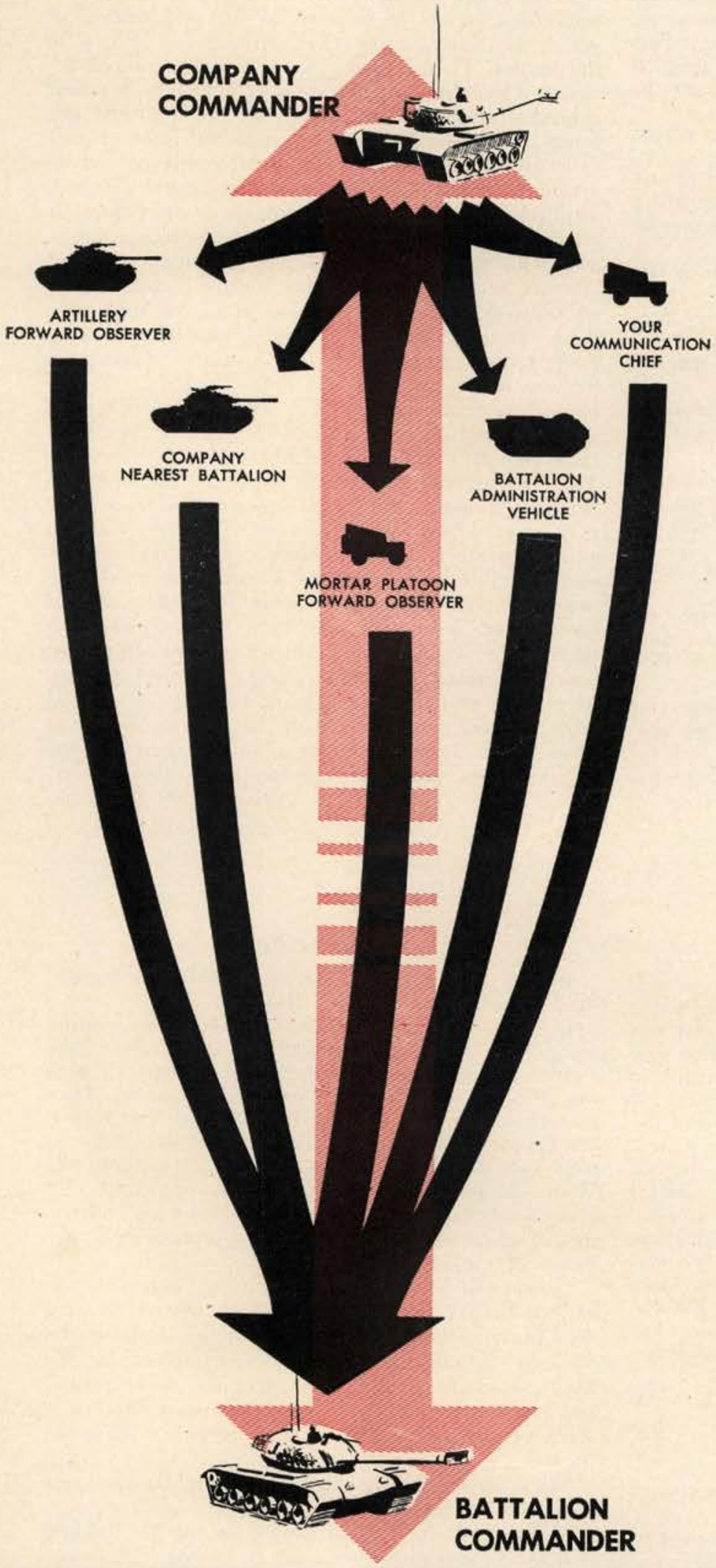
5. Try to eliminate the jamming signal by varying the squelch control. If this does not help, try turning the squelch off.

6. Send your communication chief toward the rear with your ¼-ton truck, which carries an AN/GRC-3, to act as a relay station. (When stations on a net are jammed, the establishing of relay points reduces the distance between friendly stations and has the effect of reducing the effective range of the jammer.)



Send your communication chief toward the rear with your ¼-ton truck to act as a relay station—

Solution – SECOND REQUIREMENT


COMPANY COMMANDER
ARTILLERY FORWARD OBSERVER
YOUR COMMUNICATION CHIEF
COMPANY NEAREST BATTALION
BATTALION ADMINISTRATION VEHICLE
MORTAR PLATOON FORWARD OBSERVER
BATTALION COMMANDER

1. Switch to the alternate frequency and call sign. (The providing of alternate frequencies and call signs is a part of effective preplanning to minimize jamming. Remember, it is always necessary to change the call sign when changing frequency in this situation.)

2. Try relaying through the mortar platoon forward observer. (The battalion commander is in communication with the mortar platoon leader and can therefore be reached by relay through the mortar platoon net.)

3. Try relaying through the artillery forward observer. (The battalion commander is in communication with the artillery liaison officer, who operates in the same artillery fire direction net as does the artillery forward observer.)

4. Try relaying through the command net of the company nearest the battalion commander. (It is possible that this company will still be in contact with the battalion commander on the battalion command net FM.)

5. Try relaying through the tank battalion logistical net FM. (The administrative vehicle in the battalion command post monitors this net as well as the battalion command net FM and may be able to relay for you. It should be noted that this net is one often used to provide an alternate frequency and call sign, as mentioned in paragraph 1.)

6. Contact your communication chief (whom you have already started to the rear) and have him act as a messenger.

7. If you are unable to gain contact by one of the above means, try to reach the battalion commander on the combat command command net FM. (Since the battalion commander must always maintain a link to his higher headquarters, you may be able to reach him on that net.)

8. If your forward movement has been slowed or stopped, begin laying wire to the rear.

9. Be sure to keep a set in operation on the battalion command net FM while you are trying to establish contact by other means. This immobilizes the jammer and allows our units to take offensive action against him.

FROM THESE PAGES

65 Years Ago

Occupying from east to west the broad expanse of a vast continent, stretching north and south from arctic cold to tropic heat, possessing fertile soil, boundless forests, inexhaustible mineral resources, and peopled by a race unexcelled for energy and inventive genius, the United States has no rival.

Separated as they are from all other great countries, war is almost beyond the range of possibility.

While all Europe groans with the burden of immense standing armies, which, even in these piping times of peace, shake the continent with their martial tread, the United States rests secure.

But is this security real or apparent? Canada is fast becoming a country, which, if a foe, would be worthy of our steel; Mexico keeps a larger standing army than our own; questions of great moment remain unsolved; the demon of unrest is abroad in the land, and a feverish uncertainty exists.

Who can tell what moment a storm may burst which will call into play the whole strength of our great nation.

Assuming then that the possibility of war does exist —and who after careful thought will deny it—it becomes the duty of the United States to be ready in the hour of trial.

A failure to be thus ready can result only in untold expenditure of blood and treasure.

Experience shows that time is necessary for the organization of an army, and that many months must elapse before a raw recruit can be transformed into an efficient soldier.

Organization must, therefore, at all times exist; and its form should be such as to provide the greatest possible security consistent with wise economy.

First Lieutenant W. A. Holbrook

The Proper Relative Proportions of the Three Branches of the Service

50 Years Ago

The age in which we live is matter of fact, practical, and progressive; it has little patience or even tolerance for what is merely pleasing or ornamental, and our profession, more perhaps than all others, shows how relentlessly the useful has attacked the beautiful or spectacular. The pomp and panoply of war is going, if it isn't gone. The flounces, frills, and furbelows of the military calling are passing, if they have not passed. The soldier no longer goes forward on the battlefield arrayed in brilliant uniform and inspired by the strains of martial music from a hundred bands. Or if he does, he at once calls forth the Frenchman's exclamation, "It is magnificient, but it isn't war." So, when we read of Russian bands playing on the battlefields in Manchuria we are either incredulous, or we note it as an indication that the Russians are behind the times, and our surprise at their reverses is swallowed up in amazement at their folly.

The spirit of the age whispers to us that a hundred bands means 2,000 men, and that if men are scarce, 2,000 men with rifles in their hands might turn defeat into victory; or, if men are plentiful, the place for the bands is the camp and the hospital for the diversion of the sick and wounded.

Captain Wm. W. Forsyth

Odds and Ends of Improvement

25 Years Ago

What is the Cavalry's job? How does it fit in? It is assigned a variety of missions in the performance of which its distinguishing characteristics are utilized to the utmost. These characteristics, firepower, shock action and mobility, are employed so as to form a screen behind which major movements are accomplished and forces are disposed. It moves far to the front to gain early information of an approaching enemy and to maintain contact with him. It delays hostile advances until proper dispositions can be made to meet them. It guards the rear of a retreating force, holding pursuit at arm's length until the retiring force may turn and face its adversary. It prevents hostile ground reconnaissance within prescribed areas. It guards vulnerable flanks. It raids the enemy's rear. It pursues a retiring force, keeping contact with it and encircling the main body to harass his flank and delay his retreat. It is a force in reserve that may be moved quickly to critical points as needs require. It is a liaison agency that maintains contact between or within other organizations. Thus it is trained and thus is it prepared to assist the Infantry. In asking if Cavalry is obsolete, a prior question arises which demands a prior answer. Can an army dispense with the performance of these services we have just enumerated as Cavalry missions? The newest recruit answers in unison with the seasoned commander. No graduation from military school is necessary to enable any one to see that an army must have flank protection, must have time to deploy, must be ready to initiate pursuit, must have distant ground reconnaissance; in short, must have some means at hand for the accomplishment of those varied missions heretofore assigned to and performed by the Cavalry.

Major John B. Smith

The Effect of Mechanization Upon Cavalry

10 Years Ago

Powerful as armor is, it can never deliver its Sunday Punch until it can roll over obstacles.

It is true, we have excellent obstacle crossing equipment . . . by the old standards. The bulldozer, the treadway bridge, the bailey bridge and others are now recognized essentials in an armored offensive. They nevertheless are insufficient. They are too slow to permit the proper use of armor. An enemy sniper or mortar crew can stop a bulldozer or a bridge building job. Work jobs must have outposts or some semblance of a bridgehead. Bridgeheads take time. This is the fallacy, the paradox of armor, the missing equation in the theory of tanks.

Armor will be delayed as long as we adhere to the ancient bridgehead theory. It will be delayed at each demolition as long as it takes, first, to establish the outposts or bridgeheads, second, to overcome the obstacle, third, to get the tanks over the new crossing and once again into contact with the enemy. And each delay permits the enemy time to prepare a new obstacle.

These delays during obstacle crossing are in direct opposition to the theory of tanks.

Captain Stephen M. Barker

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This book
covers the story of warfare,
not of wars, and it
emphasizes the relationship
of military operations—the
organization and use of
armies, concepts of strategy
and tactics, weapons
development and use—to the
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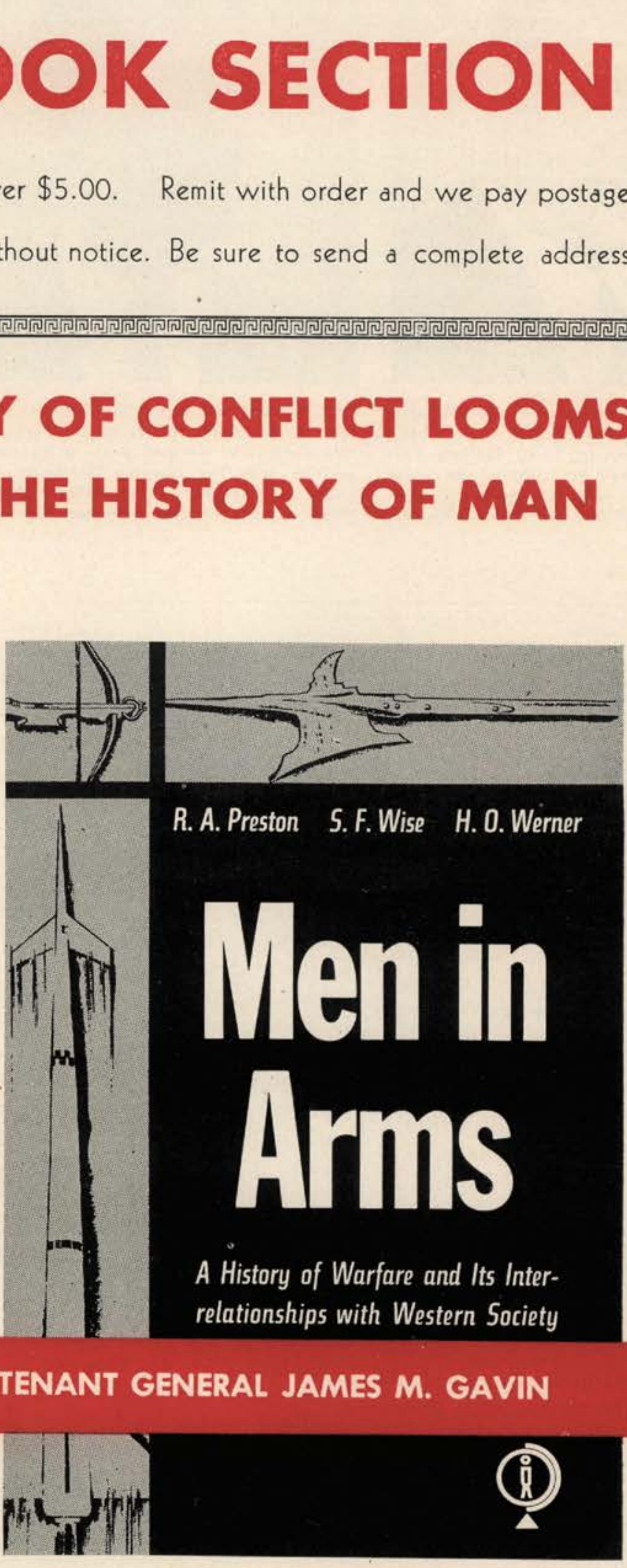
R. A. Preston S. F. Wise H. O. Werner
Men in Arms
A History of Warfare and Its Interrelationships with Western Society

REVIEWED BY LIEUTENANT GENERAL JAMES M. GAVIN

The Authors

Richard A. Preston served with the RAF during World War II. Since 1948 he has been Professor of History at Royal Military College of Canada where he instituted the course on which this book is based. He is author of many works on Military Science and History.

S. F. Wise served in the RCAF during World War II. He taught History at the Royal Military College of Canada prior to his present position with the Queen's University. Presently, his specialty is the Military and Political aspects of the American Revolution.

H. O. Werner is a member of the faculty at the U. S. Naval Academy where he teaches Naval History. During World War II he served in the U. S. Navy and is now a commander in the U. S. Naval Reserve. He is Senior Associate Editor of the U. S. Naval Institute.

MEN IN ARMS—By Preston, Wise, and Werner. Published by Frederick A. Praeger, New York, $6.50.

SOME TIME ago I was asked by a professor of one of our Eastern universities to recommend to him a book on warfare. He sought a book that would give him a complete coverage of the subject; its nature and origin, strategy and tactics, and sufficient technical detail of combat to give him an understanding of warfare as a whole. Going over in my mind the writings of Sun Tzu, Machiavelli, Clausewitz, Domini, Du Picq, Liddell Hart, J. F. C. Fuller, etc., I realized that while each was excellent, each of their writings was devoted to but a portion of the subject. There has long been a need for a book that treats of the entire subject.

Men in Arms meets this need. As expressed by the authors, the theme of the book is the "interrelationship of warfare and society in the west." The book encompasses three hundred and forty printed pages of highly condensed, very meaty history. The authors treat of warfare and society as a whole, pointing out that armies reflect the society from which they spring, and that warfare may assume many forms in terms of space, mode and objectives. Starting with the early phalanx, the pattern of the evolution of warfare, both land and sea, is developed up to the present day. From time to time the relationship of this pattern with society of the period is described to the extent that an understanding of the whole may be gained by the reader. Understandably, many subjects are treated rather superficially, leaving the reader with an appetite for more. This is well, since only through such condensation and without loss of significant trend, have the authors been able to accomplish so much.

The authors are currently teaching history and they are all World War II veterans. One was a member of the Royal Air Force, one, the Royal Canadian Air Force, and one was a member of the United States Navy. The latter, H. O. Werner, teaches naval history at Annapolis and he is well known for his frequent articles in our military periodicals. He is also the Senior Associate Editor of the U. S. Naval Institute. His contribution to the book is evident in the emphasis given to the role that sea power has played from the beginning of recorded history. This adds to the stature of the book, since most histories of warfare tend to concentrate upon land warfare to the exclusion of other media.

There is a real need for a book of this type at this time. Talleyrand once said that "war is much too serious a thing to be left to military men." Even if this may have been partially true at that time it certainly is true now, when cold war, police actions, peripheral turbulence, and pressure actions, are all part of the political-military lexicon. War, as Clausewitz has written, is the continuation of politics by other means. At one time the demarcation between peace and war was clear, but no longer is this so. The role of the civilian, and that of the soldier in hostilities, was likewise clear then. But no longer is this so, for the transition today from cold war to hot is unrecognizable.

It is the essence of democracy that the people themselves have the fullest say in the formation of their Military Establishment. In fact, any Military Establishment is a mirror of its people. The management for war must be the responsibility of our properly appointed civilian authorities. Since war has now become exceedingly complex, and the weapons systems that are the instruments of war highly technical,

U. S. Army

THE REVIEWER

Lieutenant General James M. Gavin graduated from West Point in 1929. He made his initial combat jump in Sicily as a Regimental Commander in the first major airborne assault of World War II. Later he commanded the 82d Airborne Infantry Division. Subsequent to the War he held many important posts including Commanding General of VII Corps in Europe and Assistant Chief of Staff, G3, D/A. His present position is Chief of Research and Development, D/A.

a broad understanding of the subject by civilians is of the utmost importance. And not only by civilians, but by those of us in uniform who so often merely work on an assignment from day to day, paying little attention to the military lessons of the past and concerning ourselves perhaps less with the military problems of the future.

Finally, war no longer excludes civilians from its immediate risks. As expressed by the authors, "the increasing extent to which modern war involves civilians makes it imperative that they should study military history and the history of warfare in relation to society. . . . The degree to which civilian life is affected by war, and in which civilian energies are absorbed by it, makes it essential that civilian leaders of society, whether business men, engineers, manufacturers, administrators, clergymen, or politicians, must study and understand warfare." All of us responsible for contributing in any way to the military readiness of our nation should make it our business to read and study the lessons of warfare in their many forms. *Men in Arms* is a good primer for those whose responsibilities make evident a need for such reading.

Mobility, the talisman of success, much talked about in peace and first forgotten in war, threads its way from chapter to chapter. Mobility made possible the movement of land forces in the Peloponnesian War and enabled the Greeks to consolidate their area of interest throughout a major portion of the Mediterranean. But it was the disciplined mobility of Alexander's Cavalry that made possible the consolidation of the then known world from the Indus to the Western Mediterranean. Alexander's most formidable opponents were the Persians, who depended upon masses of comparatively immobile forces. Even though greatly outnumbered, Alexander, through Cavalry shock action and great Generalship, destroyed the Persians. His was the highest form of development of Greek military thought, and with it came the establishment of an empire that laid the foundation for the Roman Empire and the coming of Christianity. The end of the Greek era came with the advent of the Roman Legion. Highly disciplined, mobile and versatile on land, and aided by an extensive network of roads throughout the Empire an adequate sea lift, the Roman Legion established an Empire that extended from England to the Middle East. It met its greatest challenge in war with innovations in mobility; the development of sea power to defeat Carthage and to transport legions to North Africa, where the ultimate decision was gained at Zama. The authors' thread of mobility continues through history to the American Civil War. In the latter the authors describe the unique attributes of American Cavalry, which used mobility to deliver firepower to the area of decision. Projecting this thread through history has meaning that must not escape us. For there are many today who, upon taking counsel from their fears of atomic warfare, can only see ahead deeper entrenched Armies and attrition without movement as our most likely prospect. If we were to consider atomic weapons and isolation this may have some validity, however slight. But now we are beyond the threshold of a new era of air mobility. An era of greater mobility-promise than any that man has known in the past. History should mean this: that we must learn how to marry this mobility to atomic firepower and then learn the technique of intelligently applying this firepower against military targets. We must learn to move the forces rapidly to the periphery of our area of interest and thus destroy aggressors at the outset. For

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To avoid entrenched armies and attrition without movement, we need land, sea and air mobility to move our

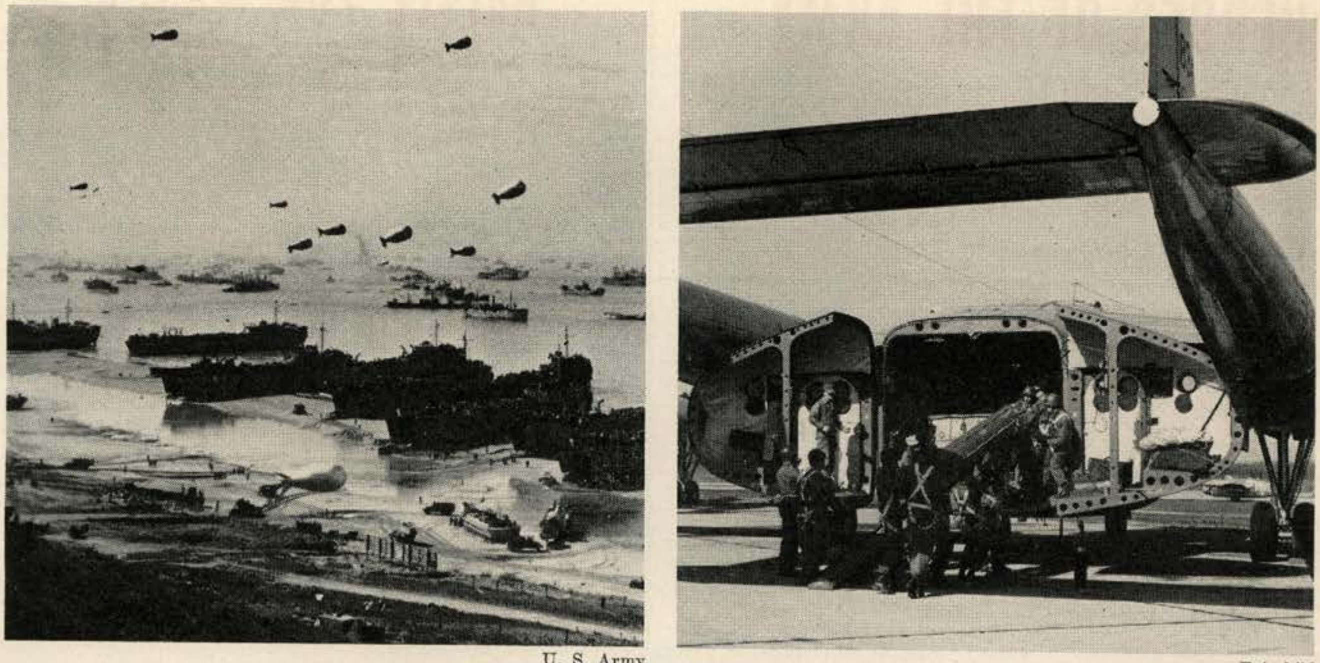
mobility is the talisman of combat success tomorrow.

There is a clear relationship which the authors develop between mobility and peace. Pointing out, as they do, that the mobility of the Roman Legion made possible *Pax Romana*. Trained, disciplined troops, well equipped with the best firepower of their time, and an excellent network of roads and adequate sea lift, made possible the rapid movement of military power to any area of possible decision around the periphery of the Roman Empire. Thus, aggressors received prompt, just punishment, and the good people of the Empire were protected. They gained confidence in the Empire and the Empire grew and prospered in an era of law and order: *Pax Romana*.

Giving practical application to the use of mobility in deploying military forces in more recent times, the authors devote a chapter to *Pax Britannica*. The authors draw upon the prophet of American sea power, Mahan, and they emphasize the significant role played by sea power in the period of Britain's greatness. Power, matched with the best global mobility of the time, was used as an instrument of policy to achieve the political, social and economic objectives of the Empire. As the authors bring this chapter, *Pax Britannica,* to its conclusion, one would expect a transition from the era of great sea power to that of modern air power. Instead, the authors merely conclude that air power would complicate the development of sea power and that sea power will have to operate in a much more unstable world, a world of vast social and technological change. This is certainly an understatement. Air power, in its fullest sense, must be developed to where we can move men and their weapons systems to any area of decision, and to support them until a decision is gained. Thus will air power attain its fullest military potential. Then will *Pax Americana* become possible. An overall evaluation of the views of the authors as reflected in *Men in Arms* would not seem to disagree with this thesis. However, the authors do not overtly support it. They interpret the lessons of history, and the application of these to the future is left to the reader.

There is an interesting aside discussion of mobility that should be noted. In describing the tactics of Frederick the Great, the authors point out that his tactics were such "partly because he was not able to trust his troops far from his immediate control." Later, in describing the use of the American Cavalry arm in the Civil War, the authors refer to "Cavalry raids deep into enemy territory, operations of a kind which Frederick the Great would never have dared to use and which Napoleon never contemplated." These are observations that have particular meaning for those today charged with training troops and the troop-leaders of tomorrow. The dispersion of the battlefield of tomorrow will be far greater than anything we have known in the past. The responsibilities of the small unit leaders for independent decision, high initiative, and prompt, decisive combat action will likewise be much greater than anything we have known thus far. And the troops necessary to carry out these decision will have to be of many skills and highly trained. Certainly there will be small place for the automaton of Frederick the Great's day. There will be need for courage, initiative, and, above all, confidence in the team and what one's fellow soldiers and other commanders are doing to achieve the common battle objective.

There are a number of errors which will be disturbing to some readers. For example, in referring to the B36 controversy the authors refer to it as "The United States Army's long-range bomber, the B36, carrying the atomic bomb." Also, in referring to the Chinese and North Korean Forces, they state "they built up an artillery fire power which was superior to that of the United Nations forces." This, of course, is not so. In describing the innovations of World War II the authors devote considerable attention to our amphibious operations. Amphibious operations are several thousand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forces rapidly to our area of interest to destroy aggressors. Mobility is the talisman of combat success of tomorrow.

years old and they received the ultimate refinement in the techniques developed by the United States and applied in the large operations of World War II, such as the Normandy landings. World War II, however, brought the first large-scale airborne operations into being. Proposed by General Mitchell in World War I, they were not attempted until World War II. Then, in the span of a few years, the Allies attained a capability of landing a complete corps by parachute and glider, which they did in several decisive operations. In terms of significance and meaning for the future, this should not be overlooked.

Combat success in the future will come to those who think more in terms of strategic and tactical innovations than merely in terms of matching inventory and stockpiles. There is a simple and obvious allure to stockpile comparison, and in stockpiles I mean everything that contributes to weapons systems. But if the lessons of history have any meaning at all, it is that through innovation and ideas a nation's resources must be applied decisively. It is in the battle application that victory is realized. Yet new ideas run contrary to people's liking. As the authors state: "The adoption of firearms was therefore comparatively slow, partly because of their cost, partly because of the conservatism of soldiers whose pride in traditional weapons is an important source of morale and therefore of fighting strength, but also because the older weapons still had a part to play." It brings us right up against the age-old dilemma of the soldier; how to convert to new weapons without deducting from the pride in performance of those that have brought victory to our arms in the past. Today we are not concerned merely with a new type of rifle. We are concerned with revolutionary forms of firepower: tactical atomic firepower. We are concerned with revolutionary forms of mobility: new forms of air mobility and land mobility. We are concerned with new forms of communications equipment that may make possible unusual and effective employment of our best firepower and mobility. And from the combination of these surely must come tactical innovations of a most unusual character. It is in this area that we must find the answers to the combat demands of tomorrow rather than in mere matching of stockpiles.

The book as a whole is accurate, well written, and a model of condensation without loss of significant trends. I believe that it should be read by all who are concerned with the development of our Military Establishment to meet the challenges of tomorrow. It is replete with lessons derived from warfare throughout history. It deals with warfare and its relation to society as a whole, limited warfare and the efforts of man to limit applied military power throughout history. It deals with total war, its origin and the trends towards it, and concludes with a good chapter on the present cold war. Throughout, the authors' ideas are well supported by timely, historical accounts that give substance to their theories.

In the final paragraph the authors state: "Unfortunately, the fear of becoming involved in another total war will compel the powers to plan also for that eventuality. It would seem that the great problem for the military planners, as far ahead as we can see, is to reconcile the two needs—military forces for local wars and preparedness for the dreaded recurrence of total war. Forces suitable for these purposes must be maintained without breaking the economy of the free world." Few would disagree with this. Yet this is the dilemma we face and only an understanding of the meaning of history will provide us with the background we need if we are to create the weapons systems that will serve our people tomorrow. And weapons systems only exist to serve the needs of people and to serve the policy of their governments. If we fail, and to the extent that we fail, our institutions will become the slaves of the weapons systems we create, and this would be disaster indeed. It is a challenging prospect. A reading and understanding of *Men in Arms* will prepare one to face the challenge.

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